

1950

The Annual Report of the
Medical Department of
the Colony of Singapore





COLONY OF SINGAPORE

MEDICAL DEPARTMENT ANNUAL REPORT, 1950

BY

W. J. VICKERS,
C.M.G., M.R.C.S. (Eng.), L.R.C.P. (Lond.),
D.P.H. (Camb.), D.T.M. & H. (Camb.),
of the Inner Temple, Barrister-at-Law,

*Director of Medical Services,
Singapore*

PRINTED AT THE GOVERNMENT PRINTING OFFICE, SINGAPORE,
BY V. C. G. GATRELL, GOVERNMENT PRINTER

To be purchased from GOVERNMENT PUBLICATIONS BUREAU,
GENERAL POST OFFICE, FULLERTON BUILDING, SINGAPORE.

1951

Price: \$2

CONTENTS

PART I—GENERAL

<i>Chapter</i>		<i>Page</i>
1	INTRODUCTORY	1
2	ADMINISTRATION	10
3	LEGISLATION	15
4	STAFF WELFARE	17
5	VOLUNTARY ORGANISATIONS AND ASSISTANCE	19
6	VITAL STATISTICS—	
	Population	22
	Births and Birth Rates	23
	Deaths and Death Rates	26
	Infant Mortality	33
	Maternal Mortality	34
	Migration Statistics	39

PART II—THE HEALTH DIVISION

7	INTRODUCTORY	43
8	INFECTIOUS DISEASE—	
	Acute Anterior Poliomyelitis	46
	Diphtheria	47
	Tropical Typhus	48
	Chicken Pox	48
	Enteric Fever	48
	Leprosy	48
9	HYGIENE AND SANITATION IN THE RURAL AREAS—	
	Mosquito Control and Malaria	49
	Sewage and Refuse Disposal	51
	Water Supply	53
	Offensive Trades	53
	Housing	54
	Food in relation to Health and Disease	55
	Training of Sanitary Personnel	56
10	MATERNAL AND CHILD WELFARE IN THE RURAL AREAS	57
11	TRAVELLING DISPENSARIES	63
12	PORT HEALTH AND QUARANTINE	65
13	AIR HEALTH	68
14	THE ISLANDS	69

<i>Chapter</i>		<i>Page</i>
15	SCHOOL HEALTH—	
	School Medical Service	71
	Leprosy and Other Conditions	73
	Tuberculosis	75
	School Dental Service	81
16	NUTRITION COUNCIL	83

PART III—THE HOSPITALS DIVISION

17	GENERAL REVIEW	89
18	THE GENERAL HOSPITAL—	
	Medical Units	96
	Surgical Units	99
	Anæsthesia	102
	Ophthalmology	102
	Dermatology	103
	Dental Clinic	105
	Dietetics	105
	Almoner	108
19	TUBERCULOSIS (TAN TOCK SENG AND ORTHOPÆDIC HOSPITALS)	111
20	VENEREAL DISEASE	132
21	MATERNITY AND GYNÆCOLOGY	143
22	LEPROSY	148
23	OTHER SPECIAL DEPARTMENTS—	
	Radiology	153
	Physiotherapy	156
	Infectious Disease	158
	Mental Disease	160
	Pathology	165
	Blood Transfusion	167
	Prisons Hospitals	171
	Police Hospital	172
	Government Medical Store	173

APPENDICES

1	THE FUTURE—SELECT COMMITTEE'S REPORT	179
2	FINANCE	193
3	III—XI	194–219

ILLUSTRATIONS

PART OF RURAL SINGAPORE	<i>Frontispiece</i>
ANTI-MALARIAL WELL	<i>Page</i> 50
PERMANENT ANTI-MALARIAL WORKS	50
PERMANENT ANTI-MALARIAL WORKS (SUB-SOIL DRAINAGE OF OPEN STREAM IN RAVINE)	52
PARAPET WELL, PULAU TEKONG	52
RURAL COASTAL VILLAGE	58
BUKIT TIMAH INFANT WELFARE CENTRE	58
BUKIT PANJANG INFANT WELFARE CENTRE	60
INFANT WELFARE CENTRE, JURONG ROAD, 10TH MILESTONE	60
POST-NATAL CLINIC	64
TRAVELLING DISPENSARY	64
ISLAND HEALTH LAUNCH	66
SCHOOL CLINIC	66
SCHOOL T.B. CLINIC	76
SCHOOL DENTAL CLINIC	76
OPERATION IN PROGRESS	95
NURSES TRAINING SCHOOL	95
TAN TOCK SENG (TUBERCULOSIS) HOSPITAL CHRISTMAS TIME	112
KANDANG KERBAU MATERNITY HOSPITAL	144
KANDANG KERBAU MATERNITY HOSPITAL	144
POST POLIO TREATMENT	157
IRON LUNG	157
WOODBIDGE (MENTAL) HOSPITAL, OCCUPATIONAL THERAPY	161
WOODBIDGE (MENTAL) HOSPITAL, GROUND-NUT GARDEN	161
WOODBIDGE (MENTAL) HOSPITAL, NEEDLEWORK CLASS	164
WOODBIDGE (MENTAL) HOSPITAL, ELECTRO CONVULSANT THERAPY	164
 GRAPHS 	
FIG. 1 TREND OF CRUDE BIRTH AND DEATH RATES, 1920 ON- WARDS	24
FIG. 2 DIAGRAM TO SHOW TOTAL BIRTHS AND DEATHS, 1940- 1950	27
FIG. 3 TREND OF INFANT MORTALITY RATES, 1920 ONWARDS	31
FIG. 4 INFANT MORTALITY RATES BY RACE, 1931-1950	32
FIG. 5 MATERNAL MORTALITY RATES, 1931-1950	35
FIG. 6 BERI-BERI DEATH RATES PER 100,000 POPULATION, 1900- 1950	37
FIG. 7 TREND OF TUBERCULOSIS DEATH RATES, 1920 ONWARDS	38
FIG. 8 POLIOMYELITIS, 1946-1950	<i>Facing</i> 46
FIG. 9 TAN TOCK SENG HOSPITAL PERCENTAGE OF T.B. CASES, MALE AND FEMALE	116
FIG. 10 TAN TOCK SENG HOSPITAL PERCENTAGE OF T.B. CASES, MALES	118
FIG. 11 TAN TOCK SENG HOSPITAL PERCENTAGE OF T.B. CASES, FEMALES	120
MAP OF SINGAPORE ISLAND	<i>Appended</i>

PART I

GENERAL

CHAPTER ONE

INTRODUCTORY

THIS report is of particular interest and importance in that 1950 completes the five-year period since the liberation following the Japanese occupation and includes a study tour in the United Kingdom undertaken by the Director of Medical Services with the Singapore Medical Plan as a background. So this note should be of assistance in assessing what has been accomplished during a short but dramatic span of time and in assessing whether what is proposed for the future is indeed the right approach to our many medical and health problems.

One outstanding fact in this picture is that the immediate post-war population to be catered for medically was far in excess of that before the war, contrary to expectation, and it has rapidly increased since then. The accommodation for the medical services was designed a long time ago and it was known to be outmoded before the war when expansion plans were under consideration. During the enemy occupation it dwindled to one hospital with some 200 beds for acute cases and one of some 500 for all other cases including lunatics. This organisation has now been built up beyond the pre-war level to a total bed strength of some 4,200, but the important point is the greatly increased passage through the beds available and the enormous increase in out-patient attendances. This has led to a tremendously increased pressure on a staff merely comparable with pre-war. The Maternity Hospital may be taken as an outstanding example in the former respect: over twice the number of in-patients is dealt with. Hospital out-patients in general have increased by some five times. There is a limit to what can be done in the way of improvisation of this sort, however, and that limit has been passed. The need for the complete provision indicated by the Medical Plan in regard to hospitalisation as early as possible should be obvious to all.

The pre-war method of expansion in the rural infant welfare field was to create new centres by renting a portion of a shophouse and by holding clinics in the open: even today only five buildings have been built expressly for the purpose. There is a limit to what can be done for a permanent service in this way also and this limit is far behind us. The Plan envisages sixteen additional clinics.

By the end of the enemy occupation such conditions as malaria and beri-beri were rampant; the population was disease-ridden. The picture presented was one of a truly woebegone and sick people. It was not a case of infant welfare centres and of specialised clinics, but of using all available space for out-patients

	Average 1939/41	(Approx.) 1944	1947	1950
	(rate per million)	(rate per million)	(rate per million)	(rate per million)
Beri-beri	873	7,940	420	242
Infantile Convulsions ..	2,393	5,378	1,603	1,343
Pulmonary Tuberculosis ..	2,288	3,913	1,550	1,193
Malaria and unspecified fevers	1,547	6,535	1,274	806
Bowel Diseases	1,802	5,421	1,007	1,167

of the most general nature. It was hoped to work back gradually to a standard of health which before the war was reckoned an achievement in the East. That not only has this been done but that records have been established in every direction, with an approach to western standards in some, with inadequate staff and accommodation must be a matter for satisfaction. No epidemic of any major infectious disease has occurred for a considerable time. In fact the health of the Colony of Singapore compares favourably with any other similar area in any part of the world. And we are dealing with a very congested island with over a million souls—a part of which is as overcrowded as any and is moreover, in much closer propinquity with dangerous health areas than most.

Such results may lead more than a few to doubt the necessity for expenditure on increased accommodation or staff and to a desire to sit back and contemplate the present picture with satisfaction. Not those, however, who have the responsibility for the public health in this eastern island colony. Note the resolution reiterated by the Public Health Conference in this connection in regard to port quarantine control and the efforts which have been made towards relaxation in this direction.

After discussion it was agreed that as passengers from the United Kingdom arriving in Singapore passed through countries infected with dangerous infectious diseases, and that as these passengers left the aerodrome and mingled freely with the general population, it was necessary for these passengers to be inoculated or vaccinated both for their own safety and the safety of Singapore. It was agreed that the regulations laid down by the World Health Organisation should be adhered to and that these regulations should not be modified. When, and if, it became possible for passengers to be isolated on the airport itself it might be possible to modify our requirements.

Air control was a matter of secondary importance before 1939: it is now a vital factor in our chain of health command and one rapidly increasing in importance. An outbreak of small-pox, of cholera, of malaria is still an ever present danger. Neither can the occurrence of increased cases of typhoid in the early part of the year and of poliomyelitis in the closing months be ignored. While these latter conditions in themselves are not of outstanding importance in our general health picture such manifestations caused considerable public uneasiness and a considerable charge on the treasury. This is particularly true of poliomyelitis through the prolonged hospitalisation and follow-up treatment required.

While Singapore can now be classed as one of the healthiest areas in the East and while its death rate compares very favourably indeed with that of England and Wales there is still a long long way to go to reach the goal the United Kingdom has attained. An enormous health step forward has been taken in Singapore over the post-war decade, but it is only a step.

That there has been some increase over the last twelve months in the crude death rate and in the infant mortality rate is of little significance unless the trend continues. Such a rapid decrease as that obtained must mean a levelling off now and then. The increase does underline the real necessity for the Medical Plan however. Good results cannot be retained indefinitely by an outmoded and inadequate organisation.

The maternal mortality rate has shown a considerable further decline, a result which has some bearing on the increasing attention which is being paid to our midwifery service, now controlling over 50 per cent of all births registered in the Colony. The hospital service dealt with over 20 per cent of the total births: the rural service covered over 60 per cent in the rural districts.

The principal causes of death continued to be bronchitis and pneumonia, infantile convulsions, pulmonary tuberculosis and acute bowel conditions in that order although in all except the first the incidence is almost half the pre-war figure. The drop in deaths from infantile convulsions and from pulmonary tuberculosis is particularly striking: 1,343 per million as compared with 2,393 in the former and 1,193 and 2,288 in the latter. Pulmonary tuberculosis and venereal disease continue to give rise to a good deal of speculation, and forecasts continue to be made of incidence without adequate statistical information. Far more is being done to combat these diseases than ever before, and the drive against them has been steadily increased from year to year over the post-war period. This drive will be very greatly enhanced when the approved Medical Plan is seen in bricks and mortar. As the facilities envisaged and the treatment available improve, so more and more cases will be dealt with, but increased work has no bearing necessarily on increased incidence which is probably less in each instance than before the war. The tuberculosis position is serious enough without any exaggeration: it is one of our major problems and will continue to be so, but it is not the only one. Venereal disease is also important, but not the outstanding and over-ruling major problem some would have us believe. We have to guard against the experts and idealists who would have us spend all our resources in one direction while leaving us to be killed from another.

Tuberculosis received little individual attention before the war and the 100 odd beds then provided have now been increased to over 500. One of the most important innovations has been in the domiciliary and family allowance fields and there has been steady progress in the care of children.

During 1950 particular attention was paid also to the introduction of B.C.G. inoculation and to the surgery of tuberculosis. These aspects of control and treatment will be really initiated during the coming year. Both Singapore Anti-Tuberculosis Association and the Government Rotary Clinics continued to expand their operations. In fact the expansion in this direction has been far more rapid than was ever anticipated.

So far efforts have been centred on those cases in which a hope of cure or arrest is possible and it is proposed to continue to concentrate on them. Pressure has been developed to transfer attention to the incurable as the most dangerous to the public at large. Certain it is that public funds cannot attempt to deal with both at this stage of our medical development without a prohibitive cost and so without a grave deterioration in other medical necessities. Today, once the supposedly dying reach the Government's care life can usually be prolonged—and this means beds and yet more beds until local housing conditions permit the extension of home nursing.

An interesting review of the general world decrease in deaths from tuberculosis appeared from the Information Centre of the United Nations office at Geneva towards the end of 1950. This was a study on thirty countries since the end of World War II. The spectacular post-war fall in a number of European countries engaged in hostilities is particularly stressed and the question is posed as to whether the end of the present century may not well find this disease as rare as leprosy is at the present time. Naturally notes of caution in regard to the value of morbidity figures alone are sounded; deaths do not reflect the prevailing number of cases in any given country: they merely give a broad indication of the severity of the problem in any one country. The reliance which has

to be placed on death statistics is also emphasised as showing the limitation of information in all countries today as in itself a reflection of the poverty of knowledge with regard to the epidemiology of tuberculosis in the world.

Over the post-war period particular attention has been paid to venereal disease in women, in view of the fact that the male side received an unduly disproportionate attention before the war. There is no doubt that many women are quite unaware of their infectious condition and this matter has been dealt with by a form of social service through supervisors who visit their homes and attempt to follow up. It cannot be stressed too clearly that this disease is as much a social condition as a medical one and future control must lie largely in the social welfare direction with girls' and boys' clubs and homes and institutions for those who have taken the wrong turning early in their lives as a priority, and proper care of the adolescent. These must remain the most important factors in the control of venereal disease. It is certain that a considerable reservoir of infection still exists in this large sea port city, but the same remark has been made in the Report of the Ministry of Health in the United Kingdom regarding similar areas. Penicillin continues to fulfil its early promise as an effective therapeutic agent in both syphilis and gonorrhœa and their treatment has been both simplified and shortened by its use.

The increase in poliomyelitis cases during the closing months of the year fell particularly heavily on the younger children, especially of the Chinese race, far more so than in any previous year. In consequence treatment by qualified physiotherapists received special attention. This is a condition in which nothing can be done during the short acute stage. It is the prolonged after-treatment which is the difficulty and for this a good deal of accommodation and staff must be an annually recurrent necessity, and in consequence a new feature of our medical service to the community.

The typhoid outbreak referred to above was no doubt connected with hawkers. This again stresses the necessity for the strictest control of individuals plying this trade in connection with food if serious and expensive difficulties are to be avoided in future.

The small islands surrounding Singapore received added attention by the initiation of a launch-dispensary service. It may be that this method of approach and that of the travelling dispensary in general cannot do enough from the more important aspect of medical health. It must be remembered, however, that a psychological approach and the giving of some attention is, and must remain, a very important factor when we are dealing with scattered sections of the population. In consequence this kind of attention must remain as an important feature. In fact it must be a good deal expanded.

Important quarantine procedure came in for a good deal of discussion during the year, particularly in regard to transit passengers by air. The Public Health Conferences which have become a feature of our public health control as a means of pooling of information and advice from the experts of the Armed Services in addition to the Municipality and Government were adamant that no relaxation of the existing procedure was possible with the small staff at the disposal of the Government division in question. Stricter rather than easier methods appear to be the general opinion and recent unfortunate experience with attempts to hide ship cases and cases in persons with seemingly correct certificates would seem to underline this cautious note. It is unfortunate that our quarantine facilities are so outmoded and outdated.

The nutrition of the people was under the constant review of the Nutrition Council. A particular study was made of food fortification, especially of rice fortification, in view of the possibility of future difficulties of supply. A reservoir of fortified rice may well prevent an outbreak of such conditions as beri-beri under emergency conditions.

A reference has been made to a study tour by the Director of Medical Services while in the United Kingdom on leave in connection with the Medical Plan for Singapore. Conversations and discussions with experts in the various fields covered during the course of this tour indicated that the existing Plan is sound enough. It requires only detailed alteration to meet recent policy demands. It should sufficiently cover all our more urgent and essential immediate requirements: it lays down adequately enough the foundations for that further advance the increasing population will render necessary. Concentration of population, and the growth of the population, play as important a part in hospital planning as in any other housing project: unfortunately the money available is bounded by revenue and expenditure as in other essential fields of social endeavour. However while our approach must be sufficiently practical it can still be imaginative. It has been indicated above that far more than the pre-war population has to be catered for at present in buildings and by staff based on a pre-war level. In fact twice the pre-war population is now in question. Prior to 1942 the actual number considered was some 250,000 less but in addition many less sought the aid of the medical services: the people in general were far less hospital and clinic minded than they are today and the citizens of Singapore demand a far higher standard of service.

The Singapore Medical Plan seeks to double the present clinical facilities in all fields, and will take us quite a long way on that road to a free service for all so ardently desired by so many of the community. Briefly the Medical Plan seeks: —

- (a) the modernisation and improvement and enlargement of all the existing hospitals;
- (b) the building of a new hospital centre which will include a general hospital block, a children's block and a women's diseases block;
- (c) the improvement and expansion of Tan Tock Seng Hospital to an 800-bedded tuberculosis centre, with a chest surgery unit, and the building of a tuberculosis sanatorium hospital with 300 beds for the more chronic cases;
- (d) an expansion of the Venereal Disease Hospital cum Out-patient cum Dispensary scheme;
- (e) a really modern settlement for lepers;
- (f) a modernisation of our mental institutional treatment with special facilities for mental defectives;
- (g) a chain of really attractive child and maternity clinics throughout rural Singapore;
- (h) a modern quarantine and dangerous infectious diseases station;
- (i) a first class school medical and dental clinic service with a mobile chain linking it to all the schools in the Colony.

All this will be welded into a workable whole so that eventually the health of every section of the population will be sufficiently catered for.

These studies particularly stress the increasing importance of the out-patient departments in modern hospitals, the need for an ever increasing domiciliary relief cum assistance scheme, and the importance of fitting what must be provided on comparatively restricted sites. By this latter phrase is meant that a large part of the hospital service must still be provided within the urban or more populated areas. In consequence, while existing sites must be used to the maximum advantage, new sites cannot be too far afield until we go to the real district or country hospital for a satellite town. Fortunately urban Singapore still has areas on its borders capable of providing plenty of space for hospital projects. The present tendency is to limit expansion on any one site to a maximum of 800 beds. Of course institutions for mental cases and for the tubercular are invariably placed in the country in spacious grounds, mainly for rehabilitation purposes. All medical institutions should have well laid out and spacious grounds. Gardens and gardeners are not a luxury in this respect but a part of the treatment.

An attempt is being made to concentrate more and more work on the out-patient department and by this is not meant a few examination and waiting rooms but an extensive organisation comprising casualty and treatment facilities, plus almoners, physiotherapists, occupational therapy, recording, X-ray, ante and post-natal and similar divisions. By the provision of such an organisation many patients who immediately go into wards need never reach this stage, and those within can be rapidly discharged. Of course all this means a much larger outdoor staff and transport, and better housing for the people who will stay in their own homes for much of their treatment. It is only by such means that the medical services can ever hope in any country to provide sufficient beds in its institutions for the sick population. Today one cannot divorce the home from the hospital. The hospital organisation truly must extend into the homes of the people on an ever increasing scale. The rural infant welfare service, the school medical and dental service, the quarantine service, must all be linked together and to the hospitals. That these can be kept in small water-tight sections is a thing of the past. Take the school children for instance. These must be constantly referred to the hospital out-patients, and many treatments not envisaged in the past can be effected by the physiotherapist and the gymnastic expert in the appropriate hospital unit and in the home. The home cannot play its part in the medical scheme unless it is a home in the proper sense of the word—a place where the individual can enjoy his leisure hours and find room for rest and recreation and cure. Attractive design in clinic and hospital is not a luxury: the gloomy and unpleasant places associated with the doctor of the past must be discarded for ever. The mind affects the body and particularly so in the sick. Such ideas do not mean necessarily lavish expense, but rather commonsense.

The National Health Service in the United Kingdom has caught the imagination of all those with the welfare of the people at heart: it is an ideal which can be and must be achieved in Singapore. As we must attain it without an upset in the economic system and without risk of chaos and an uncalled for danger to our hopes, it behoves us to move step by step and in line with the necessary advancement in our other social projects. A modern and up-to-date medical

organisation cannot co-operate with slums and without domiciliary relief. Remarkable advances and achievements have been obtained in the Colony in the social field during the post-war decade. We have now reached the stage, however, when we must continue to advance or begin to go back.

At the moment quarters for staff, improving out-patient facilities and better accommodation for children and for maternity are priorities. Quarters for staff is an immediate and urgent problem. This is as important a factor in recruitment as any other. As much of the available accommodation was designed and built on a system which is obsolete according to present day standards, the demand for rehabilitation in this respect really means rebuilding, and this is not surprising. A contented public service is not to be expected until our housing difficulties have been overcome. However, staff as such will be dealt with in the next chapter.

Action was taken in the building of the Medical Stores and the Leper Settlement during the year under review and so the Medical Plan can be said to be really under way at last. The term 'medical store' covers not only a repository for all the drugs and equipment on which the Department has to run but also a manufactory for many of those products which either must be or can be made on the spot. This is particularly important in these days of such difficulty in procurement.

The increase in the leper accommodation has been a relief because leprosy has become a real post-war problem. The increase in cases demanding admission over the post-war period has been phenomenal. So far new treatments have not led to a considerable discharge rate although every year is now expected to show a steady improvement in this respect. The main difficulty in the future, however, will be the question of rehabilitating those released, both from the fact that such patients find themselves 'lost' on leaving the settlement and also that the local population is loath to receive them into normal living channels.

Mental disease and institutional feeding were two difficult problems during 1950 which led to much anxious attention. There has been a steady increase in the number of cases seeking admission to the Mental Hospital and it would appear that the time may soon be reached when even the plans we have made in this respect will be inadequate. The Medical Plan seeks to make the mental institution one capable of providing the most modern treatment as well as sufficient occupational therapy. The tragedy is still that the type of staff available for this work is not the type which is strictly suitable for it. During the coming year it is hoped to inaugurate a scheme for the special kind of 'mental aide' envisaged in the last report of the Department. Previously most inmates in mental institutions in this part of the world received little specialised treatment: such treatment is the rule for a majority now and this requires not only a considerably increased staff but a far better trained one than formerly.

It is recognised now that institutional feeding is as important as general treatment in hospital institutions. In consequence this modern approach is one which has outmoded present possibilities. So a good deal of attention is being paid to distribution and cooking. The employment of better cooks is imperative in this respect. Better distribution and more supervision is a change which will have to come in due course but it is not one which has been overlooked.

Voluntary aid by various societies and groups of citizens has been an increasingly satisfactory feature of the medical service during the year. It is dealt with in a separate chapter this year in consequence. The thanks of the community

must be extended again to the excellent services provided by this means, and those ladies and gentlemen who have so willingly and generously given of their time to the many committees and boards connected with the Department must not be forgotten. As the medical services expand more and more assistance of all kinds from the public spirited will be called for. No large and expanding public organisation can do without aid of this kind.

Preliminary planning for emergencies of various kinds has been a feature of the work during the latter months and the St. John Ambulance Association and Brigade and the Red Cross must obviously play an important part in this connection. This planning must of necessity be one of the most important features of the work in the medical field for 1951.

The Faculty of Medicine of the University of Malaya has taken the place of the College which used to be part of the Medical Department. In consequence the report of the College which was a feature of the Annual Report of the Department is omitted this year as the University issues its own review. The College has always been intimately associated with the Medical Services of Malaya as a whole, and the new Faculty of Medicine will bear the same relationship. Nevertheless the change of status presents many problems to the Medical Department. An *ad hoc* committee was formed from both Government and University representatives to study the best method of future co-operation, with particular reference to a new form of Hospitals Board.

Staff and patient welfare continued to receive attention both through meetings with the Medical Directorate and the various sections of the Service, and an interim joint council on the lines of a Whitley council. The valuable assistance of the Assistant Trade Union Adviser is gratefully recorded in this connection. Towards the end of the year a Chief Welfare Officer was appointed by the Labour Commissioner. The services of this officer will be invaluable in this field.

The Government Medical Services cover the entire hospital organisation of the Colony except the Infectious Diseases Hospital which is under a form of joint Municipal and Government administration; all air and sea quarantine arrangements; the rural health division of some 300,000 persons; and the school medical and dental services. These are controlled by a Director of Medical Services, with a Deputy Director, a Chief Health Officer and a Chief Medical Officer.

The Director was an *ex-officio* President of the Medical Council of the Colony of Singapore and the Federation of Malaya; Registrar of the Medical Council; Chairman and Registrar of the Dental Board, Singapore; Chairman of the Hospitals Board; Chairman of the Pharmacy Board; Chairman of the Public Health Conference; Chairman of St. John Ambulance Association and Chairman of the Singapore Branch of the British Red Cross Society. He was a member of the Legislative Council throughout the year and Chairman of the following special committees which were formed to deal with special problems: venereal disease, blood transfusion, tuberculosis and U.N.I.C.E.F. He was also a member of the Council of the University of Malaya.

The Colony of Singapore consists of Singapore Island with a number of small adjacent islands, including Christmas Island and the Cocos-Keeling Group in the Indian Ocean. It came into being under the constitutional reforms of 1946.

Christmas Island is situated in the Indian Ocean and is a densely wooded area of some sixty square miles, with a small population consisting of a few hundred Chinese and Malays working in exporting the deposits of phosphate of lime found on the island. There is a medical officer and a well equipped hospital.

The Cocos-Keeling Islands consist of twenty-seven coral reefs, only two of which have any practical significance. They lie some 700 miles south-west of Java and about 550 miles distant from Christmas Island. One is used by the Cable and Wireless Company as a station and the other by Malay labourers and their families working the large coconut plantations on the islands. There is a resident medical officer.

The climate of Singapore is relatively good in spite of a close proximity to the equator. It is characterised by a uniform temperature varying from 80 degrees to 90 degrees Fahrenheit and a high average humidity of some 84 per cent. The island is flat without hills of any consequence. While there is no dry season the rainfall is considerably increased during the north-east winter monsoon. The average annual rainfall is within the hundred inch range, January being a particularly wet month.

The island is some 27 miles in length and 14 miles in breadth, and about 217 square miles in area with a population of just over a million.

An acknowledgment is due for the assistance given to the Director in the preparation of this report by various members of the staff of the Medical Department and of the Faculty of Medicine of the University of Malaya. Particular thanks are due to the Government Printer, to the Registrar of Malayan Statistics and to the Public Relations Secretary in this connection.

CHAPTER TWO

ADMINISTRATION

THE difficulty in administering a Medical Department which has to meet the ever increasing population estimated to be twice as large medically as before the war with a seriously understaffed organisation housed in outmoded buildings cannot be overestimated. The Department was still working during the period under review at a strength far below the minimum shown in the Estimates. Thus a truly remarkable picture of the work done is presented. There can be no comparison with pre-war statistics. The majority of the population is no longer prepared to suffer illness or even ill-health with that unquestioning calm that has been a byword in the East. It now expects modern attention of the most up to date kind. Since the end of the war the people have become health conscious to an extraordinary degree. New drugs together with the radio, the cinema, and the newspaper have played a notable part in this respect. This is sufficiently evidenced by the tremendous increase in our out-patient services alone and these have had to continue to operate in totally inadequate and outmoded hospital and welfare clinics with attendance returns far in advance of anything anticipated before the war. That a sufficiently excellent service has been built up within these serious limitations must be constantly kept in view. It must be clear, however, that there is a limit to advance under these conditions. The stage has been reached when not only is an ever imminent danger to public health enhanced but the risk of institutional disease is created. Another difficulty today is the lack of sufficiently trained and experienced staff. The Singapore Medical School cannot possibly turn out sufficient graduates for some time to come to fill the many vacancies that exist today in a country-wide Government service, apart from the demands of an expanding teaching institution and non-Government needs. It will meet these demands in due course. So far as Singapore is concerned the next five or six years is the danger period. The situation must be faced and not ignored, and experience and skill will have to be supplied from elsewhere to some extent for some time to come by those who have already attained this privileged position. The result of a complete stoppage in training during the Japanese occupation and the shortage of the type of personnel required elsewhere must continue its serious repercussions for a time at least. One of our chief future difficulties will be to overcome some of the insistence on surgical or medical specialisation after qualification. No national medical organisation can operate without the general duty medical officer (or its equivalent, the general practitioner) and the health officer—the backbone of any such service.

During the year a scheme of co-operation with the National Health Service of the United Kingdom on a secondment basis received the most careful consideration. It is hoped that some such short term scheme will meet our present difficulties.

A 'houseman' scheme designed to give the necessary experience to newly qualified doctors and dentists was inaugurated in 1949 and has worked satisfactorily enough: the difficulty so far has been the woefully small number of

qualified men and women coming out. The new Medical Act of the United Kingdom has made such a scheme an essential part of registration there and the fact that all newly qualified medical personnel here may well have to be included will be of benefit not only to the general public but to the medical service of the Colony.

As the Medical School is now part of the University of Malaya, a report on its activities as such is omitted from this brief review. The University issues its own report which includes that of the Medical Faculty. Suffice it to say here that the financial aid system to students was continued. With regard to new students the Singapore Government awarded six new bursaries during the year—to five medical students and to one dental student.

The following shows the number of students in the different years:—

					<i>Medical</i>	<i>Dental</i>
First year	...	...	...	...	65	31
Second year	...	...	...	...	53	20
Third year	...	...	...	...	66	16
Fourth year	...	...	...	...	50	7
Fifth year	...	...	...	...	34	8
Sixth year	.	...	...	...	28	—
Total ...					296	82

Eighty-five new students were admitted to the Medical Faculty at the beginning of the academic year of 1950 (50 medical, 20 dental and 15 pharmacy). The admission of a substantially larger number yearly than in the pre-war days has raised many difficult problems concerned with hostel accommodation, teaching staff and hospital facilities. It is frequently overlooked that more or less the same medical organisation has attempted to absorb three times the pre-war number of students.

Final professional examinations were held in June and December, 17 students qualifying in medicine and 8 in dental surgery. So far only 83 medical men and women have qualified over the five-year post-war period. A yearly output of 50 means an average of over 65 to meet the 20 per cent wastage suggested by the Carr-Saunders Report. It will be noted that this figure has only been approached comparatively recently.

The lack of sufficient trained nurses also continued to be a serious problem, and the local educational drive together with the commercial boom has tended to aggravate previous difficulties considerably. In consequence attention had to be turned to a scheme for assistant nurses, and to further recruitment under the auspices of the Franciscan Missionaire. The latter should play an invaluable part in our tuberculosis service in due course. The former should give a satisfactory career to the girl interested in nursing who is unable to deal with the prescribed course. She will nurse the more chronic sick, and will be given an opportunity of becoming a probationer in the senior scheme.

It is interesting to record that the 1949 Report of the Ministry of Health notes that the difficulty of staffing beds in the United Kingdom continues and that this is due in large part to the fact that hospitals are gradually improving working conditions generally and reducing working hours. This statement is equally true of Singapore and must be kept in mind when pre-war numbers are compared with the present position. It is a vital factor in the case and one of

the real difficulties in nursing recruitment so far as accommodation for the girls and for their training is concerned. This is now being dealt with at last and 1951 should see the plans completed in this connection.

The Ministry of Health in England also refers to the wastage of trained personnel, mainly due to marriage. This has always been a particular feature of the Singapore nursing position where the call back of the trained nurse to the home is an outstanding and most unfortunate feature of our national life. The Ministry of Health has made it clear that the main answer to the nursing shortage will have to be the more economical use of the nurse rather than the recruitment of large numbers. This means that the trained nurse will have to do the more supervisory and special work of the hospital departments and be assisted by assistant nurses and less trained personnel. All these aspects of our nursing problem are under anxious review in this Colony.

By the end of the year the necessary action had been taken to create the Nursing Council under the new Nurses Registration Ordinance which became law in 1949. So we are at last on the threshold of reaching a proper professional status for Singapore's nurses for the first time in the history of Singapore. All the necessary regulations have now been approved and when the Nursing Council meets for the first time it will be possible to obtain that reciprocity with the United Kingdom which is the general desire. This desire means obligations by our local nurses and training standards comparable with the United Kingdom however. There can be no lowering of standards in any respect from now on, and promotion will be by merit alone. One qualified sister tutor is obviously inadequate for such a nursing service as this, and it is hoped to remedy this serious defect in the not too distant future. The representations of the Director of Medical Services in this connection while he was in the United Kingdom received very sympathetic consideration. Nurses with the necessary character and experience continue to be promoted to Sister and by the beginning of 1951 twenty-seven local nurses had attained this grade out of a total of sixty-five, a very high proportion in view of all the circumstances concerned. All our health sisters are locally appointed.

The Midwifery Service continued to receive a concentrated study with a view to bringing the standard of training to that in the United Kingdom. There is no question but that the midwifery service, in particular the Midwifery Hospital, will have to be staffed to a large extent by adequately trained midwives. In consequence the addition of a Midwifery Tutor to the staff is now under action. The importance of the hospital and clinic midwife will be realised when it is noted that 13,238 births were dealt with in the 200 bedded maternity section of the Government Hospital concerned during 1950 as compared with 6,034 in 1939 and that the Government Rural Maternity Service covered 8,295 births out of 12,909 recorded. These are all time records. There is a Central Midwives Board which keeps in close touch with the Director of Medical Services and the Municipal Health Officer.

An important part of the local nursing staff has always been the hospital assistant or male nurse. The future training of this body and its incorporation into the new scheme has not been overlooked. Male nurses will continue to be an essential part of our nursing service but owing to the fact that they must be a more expensive proposition than females because of family and additional housing commitments, this section must be a comparatively small but well trained corps.

TOTAL NUMBER OF OFFICERS AUTHORISED AND AVAILABLE
IN JANUARY 1951

	Esti- mates	Per- manent	Short Con- tract and Temporary	Gone or going on long leave including study	Total to be available
<i>A.—Administrative</i>					
Director	1	1	..	..	1
Deputy Director*	1	1	..	..	1
Chief Health Officer*	1	1	..	..	1
Deputy Chief Health Officer	1	1	..	..	1
Chief Medical Officer*	1	1	..	..	1
Chief Dental Officer (new appoint- ment)	1	1	..	..	1
Medical Superintendent, Mental Hospital	1	..	1	..	1
Medical Superintendent, Kandang Kerbau	1	1	..	..	1
<i>B.—Hospitals Division</i>					
Specialist Officers, Grade B	21	11 (3 ag.)	1 (on contract)	1	11
Medical Officers including House- men	82	32	24 (6 contract)	3	53
Matrons	8	5	3 (acting)	..	8
Specialists such as Sister Tutors, Physiotherapists, Almoners, etc.	22	7	6	1	12
Sisters—Expatriate	65	26	..	7	52
Sisters—Locally appointed		22	12	1	
Nurses	393	224	53	2	275
Hospital Assistants	214	178	11	3	186
Qualified Midwives	25	9	10	..	19
Dental Staff including Dental Housemen	16	9	1	1	9
Pharmacists	9	3	..	..	3
Laboratory Assistants	18	11	..	..	11
<i>C.—Health Division</i>					
Health Officers	18	8	4	1	11
Supervisor, Public Health Works.. .. .	1	1 (agree- ment)	..	..	1
Chief Sanitary Inspector	1	1	..	..	1
Sanitary Inspectors	12	11	..	..	11
Matron	1	1 Local (acting)	..	..	1
Health Sisters (Local)	5	1	3	1	3
Health Nurses	24	9	10	1	18
Qualified Midwives	26	15	5	..	20

*Deputy Director: Dr. J. Coutts-Milne and then Dr. R. D. Gross who acted as Director while the Director was in England.

Chief Health Officer: Dr. G. H. Lowe.

Chief Medical Officer: Dr. H. Scrimgeour.

The question of study leave to all sections of the department has become a serious one and a strict limit to the number which can be spared at any one time must continue to be a difficulty until the staffing position has improved. The desire for post-graduate study must be met on an increasing scale, however, for all qualified staff, both medical and nursing. It is one which has the complete and ardent sympathy of the Medical and other Government authorities concerned.

CHAPTER THREE

LEGISLATION

ACTION was continued during the year in the review of the existing legislation connected with medicine and the public health and a study was initiated in regard to the many matters which had never been dealt with so far. Thus draft Bills were prepared covering Mental Deficiency and the Registration and Inspection of Nursing and Maternity Homes.

The question of dangerous drugs and poisons received considerable attention and an entirely new Bill detailing the former was approved in the Legislative Council towards the end of the year. Numerous amendments were made also to the Poisons Ordinance. Therapeutic substances received a separate consideration but this difficult and complicated issue is still only in the discussion stage.

As the existing Mental Diseases Ordinance was thought to be out of date a new Bill was completed covering all modern requirements.

Measures dealing with the registration and control of medical practitioners, dentists, pharmacists, nurses and midwives all received detailed planning. A new Medical Registration Bill was introduced into the Legislative Council early in the year, when it was referred to a Select Committee for further discussion and consideration, which has been delayed by the introduction of a similar measure in the United Kingdom. A Dentists Registration Ordinance was approved in 1949 but this involved a tremendous amount of administrative and technical work to complete the registration or otherwise of the large numbers of unqualified dentists admitted to practice under the Japanese regime—a work which was successfully completed during the year. A new Pharmacy Registration Bill to meet the improved advanced course of study required by modern science and the University of Malaya was submitted to Government by the end of 1950. It will be brought before the Legislative Council early in the new year. All the measures and machinery for the introduction of a Nursing Board for the Colony had been completed by the end of the year. In consequence 1951 will see this important body in operation for the first time. Discussions on the improved and longer midwifery course led to the submission of a new training and registration Bill.

A new law to control leprosy was approved. This was based on ideas propounded by the late Mr. E. R. Koek, an enthusiastic social worker, Legislative Councillor and lawyer and followed a modern study by him. It is in the way of a memorial to him. Rules under this Ordinance were also worked out on the same principle.

An amending Food and Drugs Ordinance with regulations was completed.

The Medical Department was also very interested in new measures introduced during the year covering the following: Workers Compensation, Price Control, Registration of Schools, Weekly Holidays, A Singapore Development Plan and Immigration Control.

The Hospitals Board and the Management Committee of Tan Tock Seng Hospital are controlled by specific ordinances. Revisions were considered to bring them into line with similar measures in the United Kingdom.

The unification of the Medical Services in such a form that both Asian and European rights will be satisfied received the most anxious attention and Select Committees of the Legislative Councils of both Singapore and the Federation deliberated both separately and jointly on a White Paper tabled in November 1949 in this connection. Finally separate reports were issued to each Legislature and these are still receiving attention.

CHAPTER FOUR

STAFF WELFARE

THE newly appointed Chief Welfare Officer to the Commissioner for Labour who has had a number of discussions with the administrative heads of the Medical Department writes as follows:—

All organisations rely on the knowledge and skill of their staffs but none more than the Medical Department whose services are largely personal and are functions of 'Welfare' in the widest sense.

It is natural enough that the department has for some time directed its gaze inwards towards the welfare of its own personnel in the knowledge that such attention will assist and further the efforts of the large numbers whose unremitting efforts play such an important part in the life of the community. It has been felt that Staff Welfare work could best be undertaken by officers unencumbered by other responsibilities who could give all their time to it. The request made to Government and outlined in the Annual Report for 1947 for two locally domiciled Welfare Officers has been granted and it is hoped that appointments will be made at an early date.

Staff Welfare, while a term supposedly self-explanatory, can embrace a large diversity of work. There is no intention here of limiting it by precise definition and it will comprise any activity which helps to improve the relationship between employer and employed.

The appointments are in no wise substitutes for existing machinery of 'Joint Consultation', but are designed to foster these approaches. There is not the slightest doubt that frank discussion whether between union representatives and departmental heads round the table as Joint Committees, or between the individual and the welfare officer can do anything but good. The first Joint Council established in April 1949 still has the description 'Interim' incorporated in its title. It is hoped that there will be every justification for dropping this word at an early date. There has been a gradual increase of such consultation in the Service and it is hoped to accelerate the growth. While the function of such committees is advisory and it is not possible for them to settle all matters out of hand they are a strong factor for the expression of useful recommendations for the good of the Service.

The Welfare Officers will welcome approaches from members of the staff who wish help or advice on any matter. Staff is always more willing to take problems, particularly personal ones, to someone who it is all the easier to consult as he is neutral or at the most, biassed in their favour, and who exercises no disciplinary authority over them, yet is sufficiently senior to achieve results. The existence of a person who will lend a sympathetic ear to problems or grievances is a most potent influence in maintaining a healthy staff relationship. The only grievances which cannot be tackled are those which have no vehicle for expression. The type of problem will vary from those which arise out of the course of duty, to private worries which make duty difficult of performance. In addition the Welfare Officers will be well informed on all rights and amenities available to staff with a view to making these better known. In this matter of amenities there is considerable evidence of a demand for more recreational facilities and it is hoped to extend the scope of these activities. In these the staff will be encouraged as far as possible to form their own committees and run them themselves. Certain sections have already displayed considerable initiative in this direction and there is every intention of giving every assistance to further these and other efforts.

Although, unlike many other parts of the globe, it is not a general procedure here for the staff to enjoy a complete change of environment in the matter of annual holiday. If such a habit could be engendered there would be very real benefits gained in health and wellbeing. This matter deserves, and will receive, study.

An important and useful aspect of the modern life of the hospitals of Singapore is the lively interest taken by the various divisions of the staff in the general efficiency of the hospitals and in the general wellbeing of all those whose work lies in these institutions.

The Singapore Medical Services Union, representing hospital assistants, nurses, laboratory assistants and sanitary inspectors, continued its active interest on behalf of its members. During the year it took part in two further meetings of the Medical Department's Interim Joint Council and in various discussions with the Medical Directorate.

It has been realised that the nurses who comprise such a large part of the staff of the hospitals have a great many problems peculiar to them in their life and work, and during the latter half of the year two special meetings were held between representatives of each of the various grades of nurses and the Principal Matron, matrons and sisters. These meetings of the nurses' representative council are of the highest value since in an entirely female atmosphere the nurses can and do put forward a great many questions and problems without the shyness and reticence that tend to restrain them in more formal mixed meetings.

The Singapore Medical Labour Union, representing the large body of hospital servants, kept in intimate touch with the hospital administrations concerned over matters affecting their members.

The Senior Staff Committee of the General Hospital, comprising the heads of the units and departments of the various hospitals, held meetings at regular intervals, and maintained liaison with the Medical Directorate.

Great and growing interest is shown by the nursing staff, both male and female, in the opportunities now afforded for selected members to go overseas for special training.

During the year the various athletic activities of the various hospital services continued. In September the third Annual Sports Meeting was held at Jalan Besar Stadium and was an unqualified success.

The Health Division Labourers' Co-operative Society continued to function. The increasing age of members of this section of the staff resulted in a number of withdrawals owing to retirement. It is a pity that whilst free medical attention is offered, a young labourer still withdraws \$100 from his co-operative society to meet the expenses of confinement or sickness in his family. The credit balance as at 31st December, 1950 was as follows:—

Post Office Savings Bank	...	...	...	\$ 6,987.64
Chartered Bank	...	...	...	\$11,203.07
Cash in transit	...	...	...	\$ 1,588.85
Total investments	...	...	...	\$30,706.25
Membership	...	...	...	393

CHAPTER FIVE

VOLUNTARY ORGANISATIONS AND ASSISTANCE

THE reference in this report to the activity of various voluntary bodies is an indication of their importance to the Medical Department. These non-Government organisations as well as committees on which members of the public sit, cover a wide variety of essential assistance. The Department is indeed grateful for this help which is invaluable both in the field of actual therapy and in that of advice. Without this co-operation a difficult task would become infinitely more difficult.

In the field of therapy or active assistance the following should be particularly mentioned: the Ladies Diversional Therapy Unit, the Leper Welfare Committee, the Rotary Club of Singapore, the Singapore Anti-Tuberculosis Association, the Tuberculosis Treatment Allowance Advisory Committee, the Blood Transfusion Committee, the St. John Ambulance Association and Brigade, the Singapore Branch of the British Red Cross Society and the St. Andrew's Mission Hospital for children.

The Hospital Diversional Therapy Unit has carried out a notable task amongst tuberculosis patients at both Tan Tock Seng Hospital and the Children's Orthopædic Hospital and by the end of 1950 had consolidated its activities and increased its membership. There is now genuine appreciation of diversional therapy amongst the patients.

The daily average number of patients working at various crafts under this guidance is 200 and over 350 have been trained sufficiently to carry on individual work unaided. This means a great deal to the chronic patient. A new section was organised in July and, with the help of a boy from the Bukit Timah Boys Home, fifteen blind patients are being taught cane work. At Tan Tock Seng Hospital a work room has been allocated to the unit and here the chronic tuberculous patients meet and work under the constant supervision of teachers for four mornings a week. The Prison authority has permitted one of its officers to give book-binding classes in addition.

The Branch of the unit run by the members of the American Ladies Association at the Children's Orthopædic Hospital has done excellent work under difficult conditions of transport and shortage of helpers, and its donation of \$75, together with an offer to carry on for another year, has been greatly appreciated.

The sale of finished work continues and Messrs. Robinson & Company make their store available for this at suitable intervals. All completed work is sterilised in sealed cellophane packets whether it is returned to the patient or retained for sale.

Diversional therapy must not only continue but it must expand, and the assistance of qualified occupational therapists is being sought to assist these indispensable voluntary workers. Some such organisation must remain a permanent feature of the medical scheme as work of this kind is one of the most important steps in the cure and rehabilitation of any patient suffering from an illness which necessitates prolonged institutional care. Tuberculosis is the ideal example in this connection of course. It cannot be in better hands than those of its present voluntary workers: only more and more will be required.

The Leper Welfare Committee extends aid to lepers outside the scope of departmental activity in the way of Christmas and other treats when presents are provided, and by the provision of many desirable amenities. Leper children have been 'adopted' by people who give them special attention. A troop of Scouts has been formed. Efforts in this direction mean a great deal to a section of the community which needs increasing attention from the public. Canon Adams and his splendid co-operators have given up their time and energy to a condition which is not always pleasant to contemplate: the public cannot thank them sufficiently in consequence. Now that the prospect exists for easier and earlier cure of leprosy the rehabilitation of discharged patients must arise. This further problem will need added aid from the public—certainly from that section which puts service before self.

One of the most difficult problems of the present day is that connected with tuberculosis. This is because it is such a large one, and one which has been so much neglected in the past. In consequence assistance to the growing service of the Government organisations cannot be too gratefully accepted. Apart from the ladies of the Diversional Therapy Unit, the Rotary Club of Singapore, the Singapore Anti-Tuberculosis Association and the Tuberculosis Treatment Allowance Advisory Committee deserve special thanks. Rotary presented Government some time ago with a very fine and modern clinic for the diagnosis and out-patient treatment of tuberculosis. This stands in the grounds of Tan Tock Seng Hospital and has satisfied a long felt need for what is to become the main centre for the institutional treatment of this condition in the Colony. Rotary's gift may well be recorded as the first notable step in the accepted Medical Plan of the Colony.

The Singapore Anti-Tuberculosis Association now runs an important diagnostic treatment centre in the city well away from the Rotary Clinic. It has started an experimental B.C.G. operation in addition. These efforts constitute a significant step in the history of Singapore's advance towards the control of tuberculosis.

The Tuberculosis Treatment Allowance Advisory Committee has taken those steps for the relief of the economic factor in tuberculosis without which any tuberculosis organisation must fail—a truth which has been realised in the United Kingdom and elsewhere. This aspect of our problem will be discussed at greater length in the chapter dealing with this disease. The scheme for domiciliary relief was outlined originally in a paper entitled the *Tuberculosis Policy for Singapore* laid before the Legislative Council in 1948. Its successful implementation by the Committee under the auspices of the Department for Social Welfare has meant a great amount of hard work. This Committee is to be congratulated on what has been done in starting and carrying on this essential service.

The Blood Transfusion Committee came into being early in 1949 to advise and to co-operate with the Director of Medical Services in this important field of medical endeavour. Partly through its efforts the number of donors, built up from 287 in 1946 to 1,622 in 1948, rose to 2,946 in 1949. The 1950 figure was 3,721. The Committee rejected the idea of paid donors and concentrated on obtaining new candidates through increased publicity and the distribution of certificates, with suitable badges for further gifts of blood. Early in the year Mr. George E. Lee presented the Committee with \$3,500 for further propaganda

and Messrs. Shaw Brothers completed a film for the same purpose for showing in local cinemas as an integral part of a successful 'Transfusion Week'. All this assistance is gratefully recorded.

The public always appreciates the work of the St. John Ambulance Association and Brigade and this is evidenced by the very generous donations totalling some \$15,000 on the annual Flag Day and gifts from other sources. These sums with the considerable contribution from the Government are enabling the organisation to be built up to 1,200 active workers. A Singapore Branch of the British Red Cross Society was inaugurated to deal with emergency relief and handicapped children and welfare work in general—again supplementing certain aspects of the social services. Both these organisations play a really important part in the medical and social fields in the day to day life of the Colony. In times of trouble and in emergency this must take an essential place as an auxiliary to the established Medical and Social Welfare Departments. The St. John Ambulance must become the backbone of the Civil Medical Defence Scheme. These are recognised organisations in all civilised communities.

Government Committees and Boards on which members of the public sit continue to play an important part in the medical and health development of the Colony. The Hospitals Board, the Tan Tock Seng Hospital Committee, the Medical Council, the Pharmacy Board, the Dental Board, the Nutrition Council and the Government Anti-Tuberculosis Advisory Board can be named in this connection. The Tan Tock Seng Hospital Committee functions outside the Hospitals Board which deals with all the other leading hospitals of the city because this hospital continues on the basis of a charitable trust. It has retained its distinctive and individual character ever since 1851.

The Public Health Conferences which have been a feature of the public health control of the Colony ever since the advent of the Civil Government in 1946 and the Venereal Disease Committee are composed of members of all the Services (Navy, Army and Air Force) in addition to the various Government departments concerned. Representatives of the World Health Organisation, the Federation Medical Department and the Singapore Municipality also sit on the former.

CHAPTER SIX

VITAL STATISTICS

POPULATION

SINGAPORE ISLAND

(Excluding Cocos and Keeling Islands)

THE present population figure for mid-year 1950 is based on the actual 1947 census figure plus migrational surplus plus excess births over deaths since then. On this calculation the estimate is 1,015,453.

Details by race since 1911 are as follows:—

Year	Chinese	Malays	Indians	Europeans	Eurasians	Others	Total
1911 (Census)	219,577	41,806	27,755	not available	..	..	303,321
1921 (Census)	315,151	53,595	32,314	6,145	5,436	5,717	418,358
1931 (Census)	418,640	65,014	50,811	8,082	6,903	8,295	557,745
1947 (Census)	729,473	113,803	68,967	9,279	9,110	7,512	938,144
1948 (Mid-year)	749,591	116,364	69,474	9,660	9,354	7,599	962,042
1949 (Mid-year)	761,962	119,623	70,749	10,923	9,716	7,845	980,818
1950 (Mid-year)	789,160	123,624	72,467	11,504	10,093	8,605	1,015,453

Thus there has been a remarkable increase in Singapore's population over the last nineteen years. In the twenty-year period from 1911 to 1931 the increase was some 83 per cent when the cause was mainly due to large scale immigration from India and China. Since 1931 the overall increase is about 82 per cent due to a steady increase by natural (births over deaths) means. Since the last war, in fact, the increase has been vitiated by the balance of emigration over immigration. In 1931 the number of females to males was 584 to 1,000. The ratio is now 855 to 1,000. This is the factor of real significance in present and future local population trends.

NOTES ON THE COCOS-KEELING AND CHRISTMAS ISLANDS

POPULATION, 1950

COCOS-KEELING ISLANDS				CHRISTMAS ISLAND			
1950 (Mid-year)				1950 (Mid-year)			
Chinese	..	..	13	Chinese	..	..	1,137
Malays	..	..	1,460	Malays	..	..	249
Indians	..	..	4	Indians	..	..	19
Europeans	..	..	17	Europeans	..	..	67
Eurasians	..	..	..	Eurasians	..	..	..
Others	..	..	..	Others	..	..	..
Total	..	..	1,494	Total	..	..	1,472

A reduction of 269—all Malays—over the last 12 months.

An increase of 256 over the last twelve months.

BIRTHS AND DEATHS, 1950

COCOS-KEELING ISLANDS				CHRISTMAS ISLAND			
		Males	Females			Males	Females
Births	..	44	28	Births	..	30	33
Deaths	..	14	9	Deaths	..	14	2

BIRTHS AND BIRTH RATES

			1931		1947		1950	
			Number	Rate	Number	Rate	Number	Rate
Chinese	..	..	15,993	37.85	33,629	46.20	36,165	45.83
Malays	..	..	2,862	43.69	5,473	47.73	5,758	46.58
Indians	..	..	1,020	19.64	3,087	43.30	3,197	44.12
Europeans	..	..	169	20.55	312	35.79	570	49.55
Eurasians	..	..	199	28.53	359	39.84	321	31.80
Others	..	..	227	29.09	185	28.27	360	41.84
Total	..	..	20,470	36.37	43,045	45.89	46,371	45.67
Male	..	..	10,753	..	22,152	..	23,857	..
Female	..	..	9,717	..	20,893	..	22,514	..
Total	..	..	20,470	..	43,045	..	46,371	..
Male births per 100 births	..	..	52.04		51.23		51.45	

BIRTHS BY SEX AND RACE

			Urban Area	Rural Area	Singapore Total
<i>Males</i>					
Europeans	..	..	117	194	311
Eurasians	..	..	157	11	168
Chinese	..	..	13,858	4,789	18,647
Malays	..	..	1,738	1,205	2,943
Indians	..	..	1,242	346	1,588
Others	..	..	180	20	200
Total	..	..	17,292	6,565	23,857
<i>Females</i>					
Europeans	..	..	88	171	259
Eurasians	..	..	142	11	153
Chinese	..	..	12,875	4,643	17,518
Malays	..	..	1,674	1,141	2,815
Indians	..	..	1,252	357	1,609
Others	..	..	139	21	160
Total	..	..	16,170	6,344	22,514
Grand Total	..	..	33,462	12,909	46,371

The annual increase in the number of births over the post-war period received a check in 1950 in that the 1950 figure of 46,371 barely passed the 1949 figure of 46,169. This resulted in a reduction in the 1949 rate of 47.07 per 1,000 of the population to 45.67.

TREND OF CRUDE BIRTH AND DEATH RATES IN SINGAPORE: 1920 ONWARDS

(Rates are the number of births reported per 1,000 total population:
Rates are the number of deaths reported per 1,000 total population)

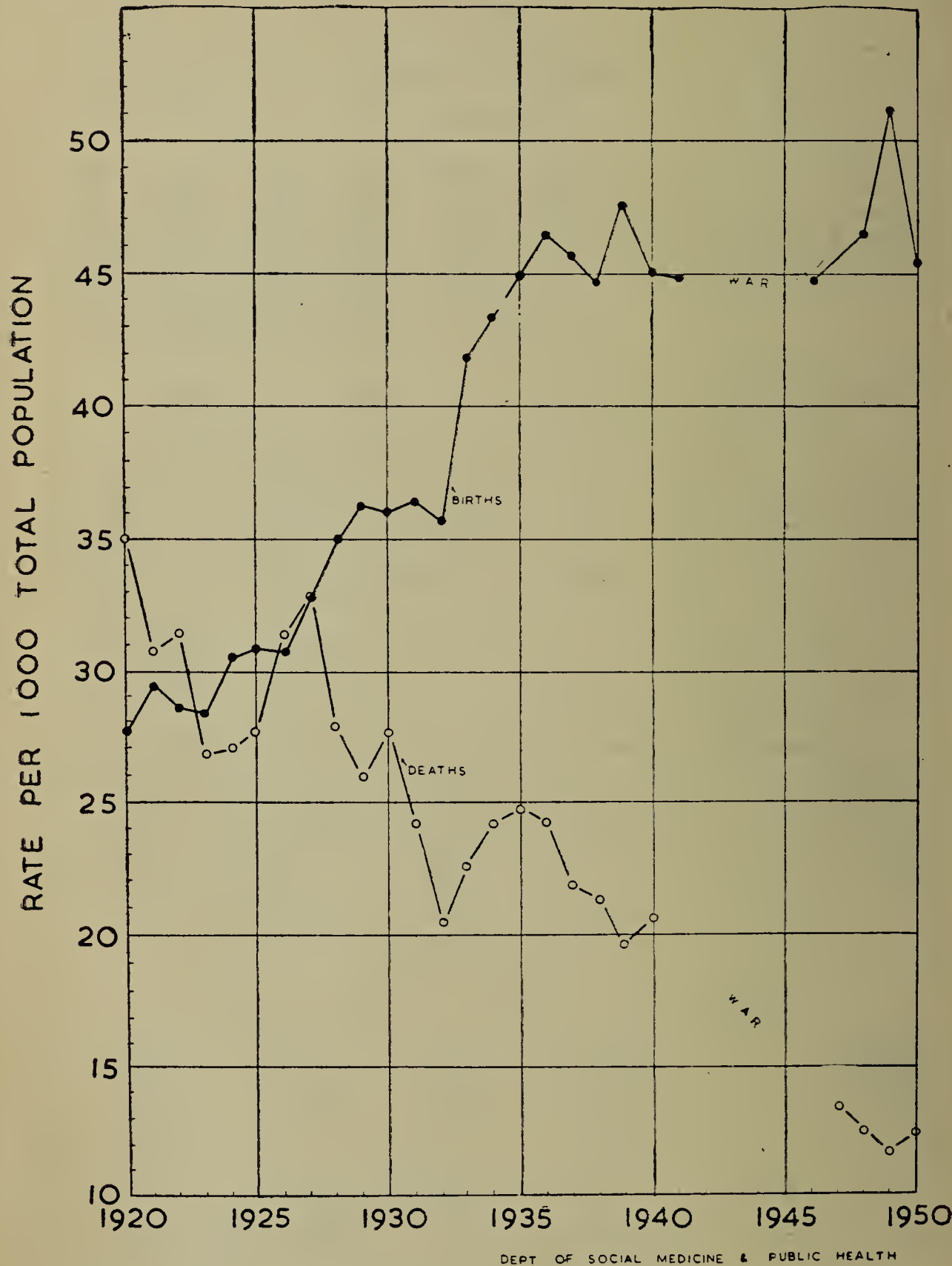


Fig. 1

Mother's Age	EUROPEANS		EURASIANS		CHINESE		MALAYS		INDIANS		OTHERS		TOTAL	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
14 years	..	..	..	..	..	3	5	6	11	7	1	..	17	13
15 years	..	..	..	1	6	..	48	58	15	22	2	..	71	84
16 years	..	..	..	1	44	30	108	104	36	35	..	2	188	172
17 years	..	1	..	1	126	78	131	111	59	46	3	3	320	240
18 years	..	..	1	8	337	321	200	195	102	110	2	5	650	639
19 years	..	2	8	4	560	522	159	170	101	79	2	10	830	787
20 years	5	2	9	6	792	740	284	241	125	135	9	11	1,224	1,135
21 years	13	11	6	6	1,045	975	166	176	99	102	16	9	1,345	1,279
22 years	12	14	13	11	1,146	1,057	224	243	130	121	14	12	1,539	1,458
23 years	18	18	12	4	1,104	1,057	181	116	83	112	13	9	1,411	1,316
24 years	16	15	10	9	1,013	1,043	147	125	96	110	7	8	1,289	1,310
25 years	30	16	10	14	940	870	178	200	99	105	16	12	1,273	1,217
26 years	19	21	15	9	1,010	935	144	141	68	88	16	9	1,272	1,203
27 years	29	23	8	8	830	853	122	142	108	81	15	9	1,112	1,116
28 years	23	15	12	8	999	868	147	147	75	71	14	7	1,270	1,116
29 years	20	21	10	5	850	770	89	85	57	52	4	9	1,030	942
30 years	19	22	8	14	878	865	141	135	72	64	8	11	1,126	1,111
31 years	23	13	5	8	751	753	61	63	32	30	9	4	881	871
32 years	14	11	12	5	816	755	101	80	54	60	10	4	1,007	915
33 years	15	12	7	5	703	604	32	37	25	20	11	3	793	681
34 years	10	14	2	7	681	728	17	35	30	21	5	..	745	805
35 years	6	5	4	1	735	623	81	63	28	43	6	8	860	743
36 years	9	4	1	2	601	603	38	31	24	31	3	5	676	676
37 years	8	3	..	2	567	518	41	38	19	18	2	..	641	541
38 years	6	5	1	1	584	501	29	17	18	17	3	1	455	430
39 years	5	4	1	3	428	404	12	10	6	8	3	2	427	391
40 years	6	2	2	6	387	348	26	22	4	11	2	1	224	222
41 years	..	1	2	3	211	206	9	6	2	5	..	..	213	238
42 years	1	1	..	..	196	225	7	7	6	5	3	..	135	113
43 years	2	2	..	..	128	109	5	2	..	..	..	..	82	83
44 years	..	1	..	..	82	77	..	4	..	..	..	1	55	50
45 years	..	..	..	1	47	44	5	3	3	..	..	2	58	34
Over 45 years	1	..	..	..	50	32	5	2	1	..	1	..	..	..
Total	311	259	168	153	18,647	17,518*	2,943	2,815	1,588	1,609	200	160	23,857	22,514*

* Includes one age unknown.

The crude birth rate does not give a satisfactory index of the child-bearing capabilities of the various races in an area like Singapore where the sex ratio varies. More comparative figures could be based on the number of women in the various race groups. There were 36,165 births in respect of 376,093 Chinese women, a ratio of 96 per thousand women; 5,758 births in respect of 56,584 Malay-sian women, a ratio of 101 per thousand women; and 3,197 births in respect of 20,619 Indian women, a ratio of 155 per thousand women. These ratios probably give a more accurate indication of the comparative fertility of the various components of the population than the ordinary birth rate. The figures for women given above include all ages and all conditions, both married and single. Amongst the Chinese there are many women employed in manual labour and domestic employment who suffer from what may be described as 'occupational castration', so that the birth rate amongst those Chinese women who bear children may well be higher than the figure of 96 might indicate.

DEATHS AND DEATH RATES

			1931		1947		1950	
			Number	Rate	Number	Rate	Number	Rate
Chinese	..	..	10,599	25.09	9,368	12.87	9,329	11.82
Malays	..	..	1,905	29.08	2,029	17.70	2,000	16.18
Indians	..	..	820	15.81	878	12.32	717	9.89
Europeans	..	..	51	6.20	74	8.49	93	8.08
Eurasians	..	..	103	14.76	84	9.32	88	8.72
Others ..	..	..	145	18.58	78	11.92	85	9.88
Total	..	..	13,623	24.20	12,511	13.34	12,312	12.12

DEATHS BY SEX AND RACE, 1950

				Urban Area	Rural Area	Singapore Total
<i>Males</i>						
Europeans	..	..	..	41	28	69
Eurasians	..	..	..	39	3	42
Chinese	..	..	..	4,356	1,054	5,410
Malays	..	..	..	675	436	1,111
Indians	..	..	..	390	76	466
Others	..	..	..	45	6	51
Unknown	..	..	..	1	..	1
Total	..	..	..	5,547	1,603	7,150
<i>Females</i>						
Europeans	..	..	..	14	10	24
Eurasians	..	..	..	42	4	46
Chinese	..	..	..	3,207	712	3,919
Malays	..	..	..	543	346	889
Indians	..	..	..	205	46	251
Others	..	..	..	23	5	28
Unknown	..	..	..	3	..	3
Total	..	..	..	4,037	1,123	5,160
Unknown Race and Sex	..	..	..	2	..	2
Grand Total	..	..	..	9,586	2,726	12,312

DIAGRAM TO SHOW TOTAL BIRTHS AND DEATHS FOR PERIOD 1940-1950

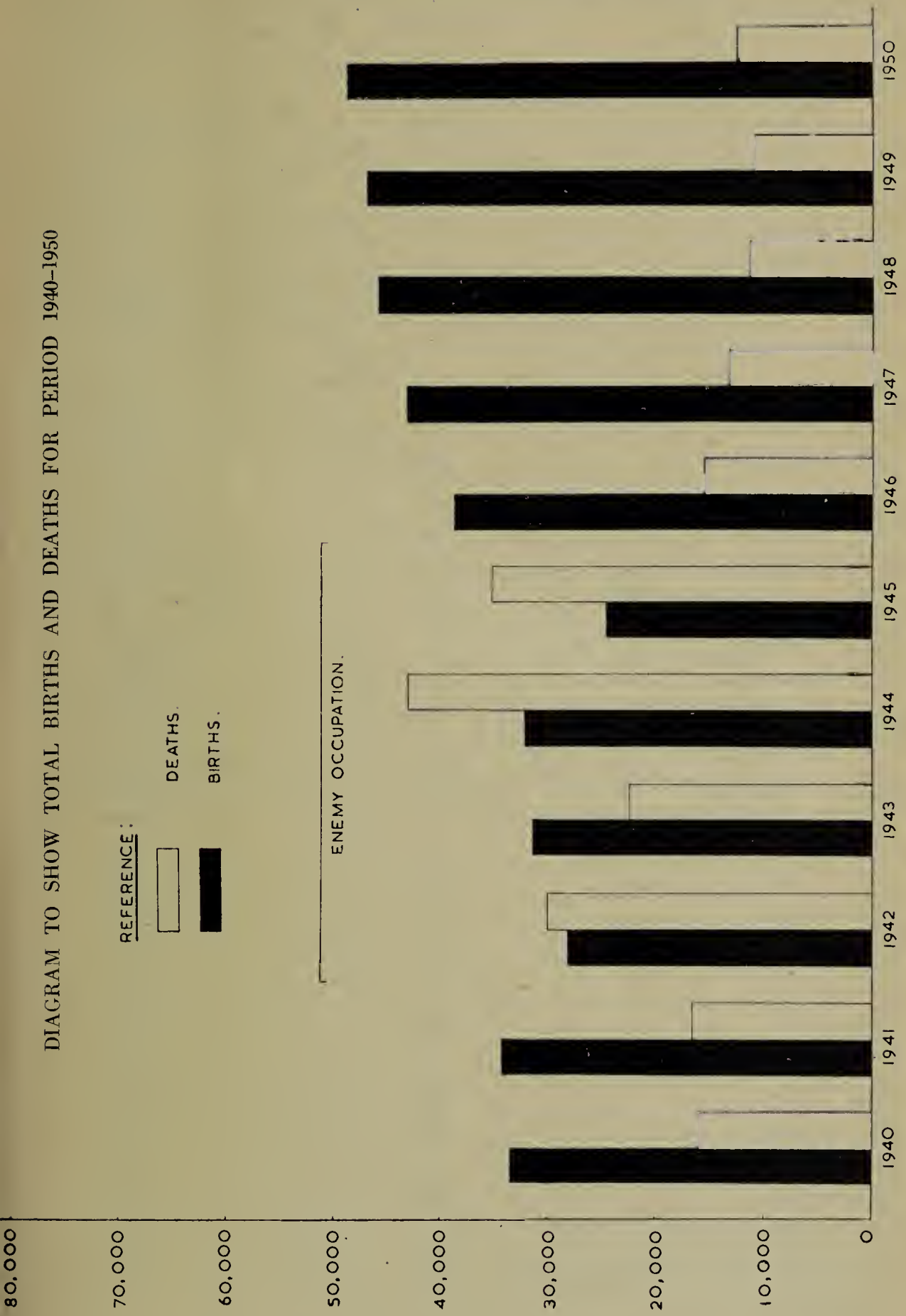


Fig. 2

COLONY OF SINGAPORE

DEATHS BY AGE GROUPS, 1950

Ages	Urban Area	Rural Area	Singapore Total
0 — 1 day	323	95	418
1 — 7 days	350	93	443
8 — 14 days	184	22	206
15 — 21 days	165	32	197
22 — 28 days	107	12	119
NEO-NATAL DEATHS	1,129	254	1,383
1 — 2 months	496	130	626
2 — 3 months	319	91	410
3 — 4 months	145	26	171
4 — 5 months	148	45	193
5 — 6 months	111	20	131
6 — 7 months	149	39	188
7 — 8 months	112	30	142
8 — 9 months	131	51	182
9 — 10 months	116	29	145
10 — 11 months	108	31	139
11 — 12 months	74	29	103
INFANTILE MORTALITY	3,038	775	3,813
1 — 5 years	1,225	493	1,718
5 — 10 years	156	72	228
10 — 15 years	136	36	172
15 — 20 years	177	45	222
20 — 25 years	289	65	354
25 — 30 years	245	57	302
30 — 35 years	343	66	409
35 — 40 years	469	121	590
40 — 45 years	511	113	624
45 — 50 years	522	114	636
50 — 55 years	576	114	690
55 years and over	1,898	655	2,553
Age Unknown	1	..	1
GRAND TOTAL	9,586	2,726	12,312

DEATHS GROUPED ACCORDING TO AGE, SEX AND RACE REGISTERED IN SINGAPORE FOR THE YEAR
1950

Age Groups	Sex	Europeans	Eurasians	Chinese	Malays	Indians	Others	Unknown	Total
0 — 1 day	{ M. F.	3 2	1 1	167 103	56 38	18 21	3 2	.. 2*	248 169*
1 — 7 days	{ M. F.	1 ..	1 ..	173 153	44 36	15 12	6 1	1 ..	241 202
8 — 14 days	{ M. F.	.. ..	.. ..	74 93	18 10	6 5	.. ..	.. ..	98 108
15 — 21 days	{ M. F.	.. ..	.. ..	57 102	18 12	7 1	.. ..	.. ..	82 115
22 — 28 days	{ M. F.	.. ..	.. ..	29 67	10 11	2 ..	.. ..	.. ..	41 78
Neo-Natal Deaths ..	M. & F.	6	3	1,018	253	87	12	4	1,363
28 days — 2 months ..	{ M. F.	1 ..	2 1	217 236	82 44	22 16	4 1	.. ..	328 298
2 — 3 months	{ M. F.	.. ..	1 2	145 141	58 44	7 10	1 1	.. ..	212 198
3 — 4 months	{ M. F.	1 ..	1 1	61 53	15 25	6 8	.. ..	.. ..	84 87
4 — 5 months	{ M. F.	1 1	.. 1	51 71	29 25	4 7	3 ..	.. ..	88 105
5 — 6 months	{ M. F.	.. ..	.. ..	57 34	19 13	4 4	.. ..	.. ..	80 51
6 — 7 months	{ M. F.	.. 1	1 ..	66 64	24 20	6 4	2 ..	.. ..	99 89
7 — 8 months	{ M. F.	.. 1	.. ..	51 41	20 19	5 4	.. 1	.. ..	76 66
8 — 9 months	{ M. F.	2 ..	1 1	70 59	24 14	5 6	.. ..	.. ..	102 80
9 — 10 months	{ M. F.	1 1	.. ..	59 46	13 21	1 3	.. ..	.. ..	74 71
10 — 11 months	{ M. F.	.. 1	.. ..	49 49	22 14	3 ..	.. 1	.. ..	74 65
11 — 12 months	{ M. F.	.. ..	1 1	41 38	14 4	2 2	.. ..	.. ..	58 45
Infantile Mortality ..	{ M. F.	10 7	9 8	1,367 1,350	466 350	113 103	19 7	1 2*	1,985 1,827*
Carried forward ..		17	17	2,717	816	216	26	4	3,813

*One unknown sex.

COLONY OF SINGAPORE

DEATHS GROUPED ACCORDING TO AGE, SEX AND RACE REGISTERED IN SINGAPORE FOR THE YEAR
1950—*continued*

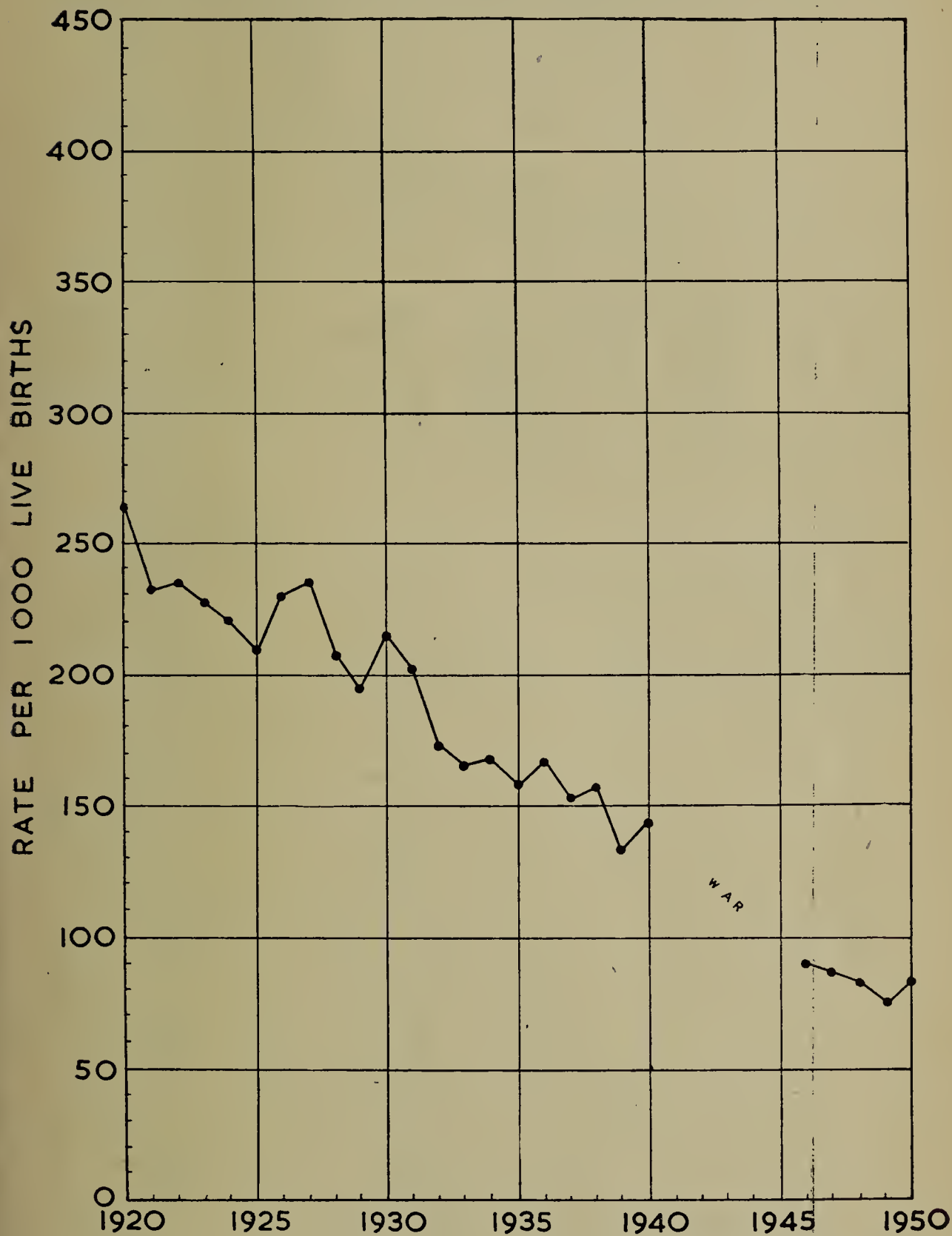
Age Groups	Sex	Europeans	Eurasians	Chinese	Malays	Indians	Others	Unknown	Total
<i>Brought forward</i> ..	{ M. F.	10 7	9 8	1,367 1,350	466 350	113 103	19 7	1 2*	1,985 1,827*
1 year — 5 years ..	{ M. F.	.. 1	5 3	680 608	175 149	47 43	1 6	.. ..	908 810
5 years — 10 years ..	{ M. F.	.. ..	1 1	96 80	20 16	7 7	.. ..	.. ..	124 104
10 years — 15 years ..	{ M. F.	.. ..	.. 1	75 60	11 16	5 4	.. ..	.. ..	91 81
15 years — 20 years ..	{ M. F.	4 1	.. ..	81 80	14 24	5 10	1 2	.. ..	105 117
20 years — 25 years ..	{ M. F.	8 2	2 2	137 93	38 34	18 15	3 2	.. ..	206 148
25 years — 30 years ..	{ M. F.	5 2	.. 2	119 74	33 38	21 4	4 ..	.. ..	182 120
30 years — 35 years ..	{ M. F.	9 ..	.. 2	172 130	32 27	27 7	2 1	.. ..	242 167
35 years — 40 years ..	{ M. F.	5 ..	1 4	279 166	45 36	35 16	2 1	.. ..	367 223
40 years — 45 years ..	{ M. F.	3 ..	3 3	318 166	46 35	37 9	4 ..	.. ..	411 213
45 years — 50 years ..	{ M. F.	5 2	1 ..	372 143	42 24	34 7	3 3	.. ..	457 179
50 years — 55 years ..	{ M. F.	8 2	6 2	410 153	38 22	41 4	4 ..	.. ..	507 183
55 years and over ..	{ M. F.	12 7	14 18	1,304 816	151 118	76 22	8 6	.. 1	1,565 988
Age Unknown ..	{ M. F.	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
Total ..	{ M. F.	69 24	42 46	5,410 3,919	1,111 889	466 251	51 28	1 3*	7,150 5,160*
Grand Total ..		93	88	9,329	2,000	717	79	6	12,312

The death rate for 1949 was the lowest on record at 11.84 per 1,000 of the population. The 1950 rate shows a slight increase to 12.12, but this is still lower than any year previous to 1949 and still compares with the England and Wales rate of 12.3 for 1947. The latest England and Wales rate available is that of 1948 of 11.0 however. Whilst there has been an increase in deaths from

*Two unknown sex.

TREND OF INFANT MORTALITY RATES IN SINGAPORE: 1920 ONWARDS

(Rates are the number of deaths reported under one year of age per 1,000 live births)



DEPT. OF SOCIAL MEDICINE & PUBLIC HEALTH

Fig. 3

SINGAPORE INFANT MORTALITY RATES BY RACE, 1931-1950

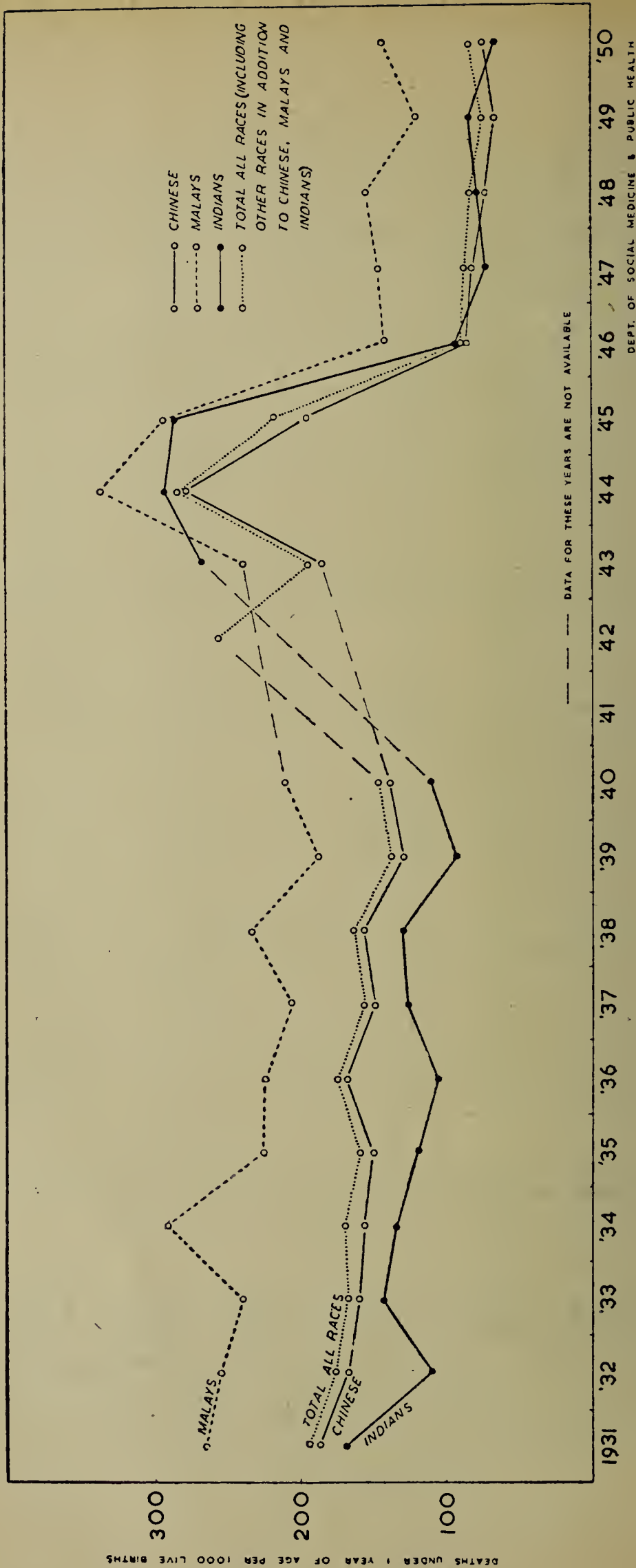


Fig. 4

violence, senility, cancer, heart affections, diseases of the respiratory tract and from diseases of the intestinal tract, the decline in pulmonary tuberculosis has continued the index reaching a low record of 52 as compared with 100 in the 1939/41 average. Significantly infantile convulsions showed no rise.

The general good health of the Colony continues.

INFANT MORTALITY

Race	1931		1947		1950	
	Number	Rate	Number	Rate	Number	Rate
Chinese	3,041	183.83	2,671	79.43	2,717	75.13
Malays	722	261.35	784	143.25	816	141.72
Indians	171	163.73	236	76.45	216	67.56
Europeans	5	29.59	18	57.69	17	29.82
Eurasians	23	110.55	28	77.99	17	52.96
Others	34	149.78	21	113.51	30	83.33
Total ..	3,996	191.30	3,758	87.33	3,813	82.23

				URBAN AREA		RURAL AREA		SINGAPORE		Rate per mille of births
				Births	Deaths under one year	Births	Deaths under one year	Birtbs	Deaths under one year	
FIRST QUARTER										
January	..	..	}	8,123	734	3,123	206	11,246	940	83.59
February	..	..						
March	..	..						
SECOND QUARTER										
April	..	..	}	8,440	797	3,260	184	11,700	981	83.85
May	..	..						
June	..	..						
THIRD QUARTER										
July	..	..	}	8,241	794	3,164	207	11,405	1,001	87.77
August	..	..						
September	..	..						
FOURTH QUARTER										
October	..	..	}	8,658	713	3,362	178	12,020	891	74.13
November	..	..						
December	..	..						
Total ..				33,462	3,038	12,909	775	46,371	3,813	82.23

Rate per mille of births for 1950 = 82.23.

The infant mortality rate (deaths under one year of age per 1,000 live births) showed a rise to 82.23 from the 1949 low record of 72.04. Even so, this compared very favourably with the pre-war returns (130.47 in 1939; 191.30 in 1931 and 285.0 in 1944). The increase is due mainly to deterioration in the Malay rate. Nevertheless this is still well under the 1948 figure of 155.27. Surprisingly, the Indian is the only race to show a continued reduction and this is considerable (from 80.89 to 67.56). Our present rate corresponds to the 1920 England and Wales figure (1916-20=90.90). A reduction to the 40.0 range is envisaged when our Medical Plan in regard to our infant and maternity services is in full operation. There is still undue delay in seeking qualified advice although this tendency has shown a considerable improvement over the post-war decade.

Of the 3,813 infant deaths registered in Singapore during the year 1950, 1,985 were of males and 1,827 were of females, there being one of undetermined sex.

Still births accounted for 17.4 per 1,000 of all births as compared with 17.2 in 1949. This figure compares favourably with the 1948 England and Wales figure of 23.2.

The important neo-natal mortality rate was 29.8 per 1,000 live births compared with 28.0 in 1949 and 32.8 in 1948. The hesitancy over a continuing drop however, shows the necessity for the Medical Plan. The England and Wales figure was 19.7 for 1948.

The really significant rise was in the one to three months post-natal period, and later as compared with the English figures. Bad dietary habits play their part here, a particular factor in the high Malay rate.

			SINGAPORE		ENGLAND AND WALES
			1949	1950	1948
Singapore infant mortality rate (deaths under 1 year per 1,000 related births)	under 4 weeks	..	28.0	29.8	19.7
	1 to 3 months	..	16.7	22.3	5.5
	3 to 6 months	..	10.1	10.7	4.8
	6 to 9 months	..	9.6	11.0	2.6
	9 to 12 months	..	7.5	8.3	1.4
Rate ..			..	..	34.0

MATERNAL MORTALITY

The maternal mortality rate continued to decline and was 1.85 per 1,000 total births as compared with 2.2 in 1949, over 7.0 in 1945 and 4.0 in 1939. The corresponding figure for England and Wales in 1948 was 1.02.

MATERNAL MORTALITY RATES IN SINGAPORE, 1931-1950

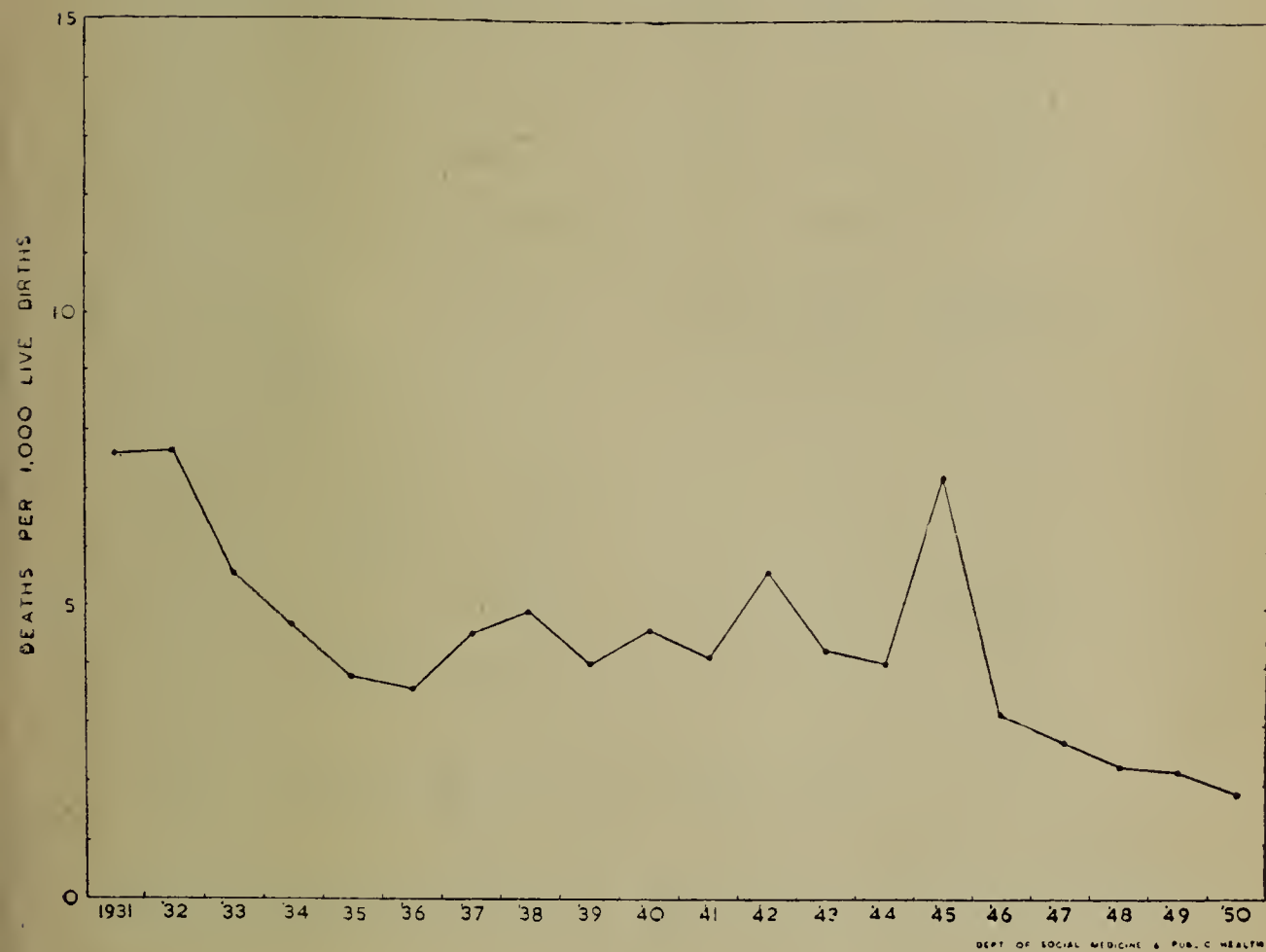


Fig. 5

TOTAL NUMBER OF DEATHS, RATE PER MILLION OF POPULATION AND COMPARISON WITH THE AVERAGE RATE FOR 1939/1941 BY PRINCIPAL CAUSES OF DEATHS

Causes	AVERAGE 1939/1941		1947			1948			1949			1950		
	No. of deaths	Rate per mil- lion	No. of deaths	Rate per mil- lion	Index	No. of deaths	Rate per mil- lion	Index	No. of deaths	Rate per mil- lion	Index	No. of deaths	Rate per mil- lion	Index
Malaria and Unspecified Fever ..	1,159	1,547	1,207	1,274	82	971	999	65	838	854	55	819	806	52
Violence (all forms) ..	477	637	573	605	95	457	470	74	443	452	71	494	486	76
Beri-beri ..	654	873	398	420	48	312	321	37	235	240	27	246	242	28
Senility ..	927	1,237	955	1,008	81	920	946	76	897	915	74	1,033	1,017	82
Bronchitis, Pneumonia and Tuberculosis of Respiratory System ..	3,513	4,689	3,013	3,180	68	2,902	2,985	64	2,851	2,907	62	2,845	2,802	60
Heart Diseases ..	491	655	403	425	65	433	445	68	452	461	70	567	558	85
Diseases of the Circulatory System ..	168	224	112	118	53	173	178	79	197	201	90	204	201	90
Diseases of the Digestive System ..	409	546	253	267	49	340	350	64	364	371	68	429	422	77
Diseases of Pregnancy, Childbirth and the puerperal state ..	145	192	125	132	68	108	112	58	102	104	54	86	85	44
Premature Births and Diseases of Early Infancy ..	849	1,135	853	900	79	896	931	82	723	737	65	812	800	70
Infantile Convulsions ..	1,793	2,393	1,519	1,603	67	1,257	1,293	54	1,306	1,332	56	1,364	1,343	56
Diseases of the Respiratory System ..	416	555	333	351	63	322	331	60	318	324	58	400	394	71
Tuberculosis other than Respiratory System ..	186	248	167	176	71	233	240	97	270	275	111	266	262	106
Diseases of the Genito-Urinary System ..	548	731	277	292	40	285	293	40	279	284	39	242	238	33
Diseases of the Nervous System ..	438	585	263	278	48	303	312	53	349	356	61	320	315	54
Influenza, Acute Rheumatism ..	279	372	208	220	59	101	104	28	103	105	28	86	85	23
Typhoid, Dysentery, Diarrhoea and Enteritis ..	1,350	1,802	954	1,007	56	1,064	1,094	61	1,039	1,059	59	1,185	1,167	65
Cancer ..	353	471	306	323	69	334	344	73	296	302	64	340	335	71
Others ..	1,147	1,531	592	625	41	522	537	35	559	570	37	574	565	37
Total ..	15,302	20,425	12,511	13,206	65	11,933	12,275	60	11,621	11,848	58	12,312	12,125	59
Pulmonary Tuberculosis ..	1,714	2,288	1,468	1,550	68	1,449	1,491	65	1,290	1,315	57	1,211	1,193	52

Indices are based on 1939/1941 average rate per million of population.

SINGAPORE BERI-BERI DEATH RATES PER 100,000 POPULATION, 1900-1950

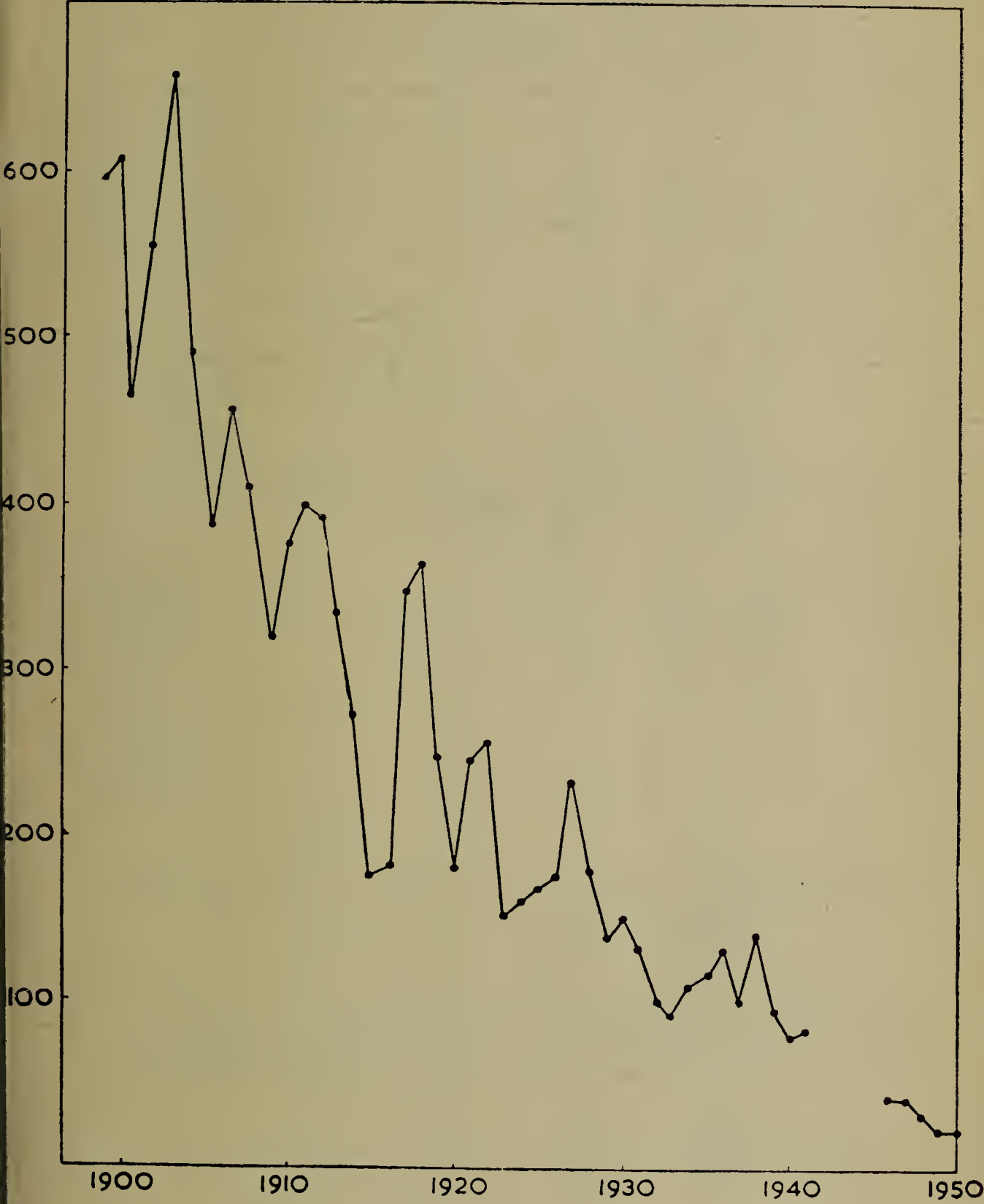


Fig. 6

TREND OF TUBERCULOSIS DEATH RATES: 1920 ONWARDS

(Singapore and certain other countries)

(Rates are the number of deaths reported from tuberculosis (all forms) per 100,000 total population)

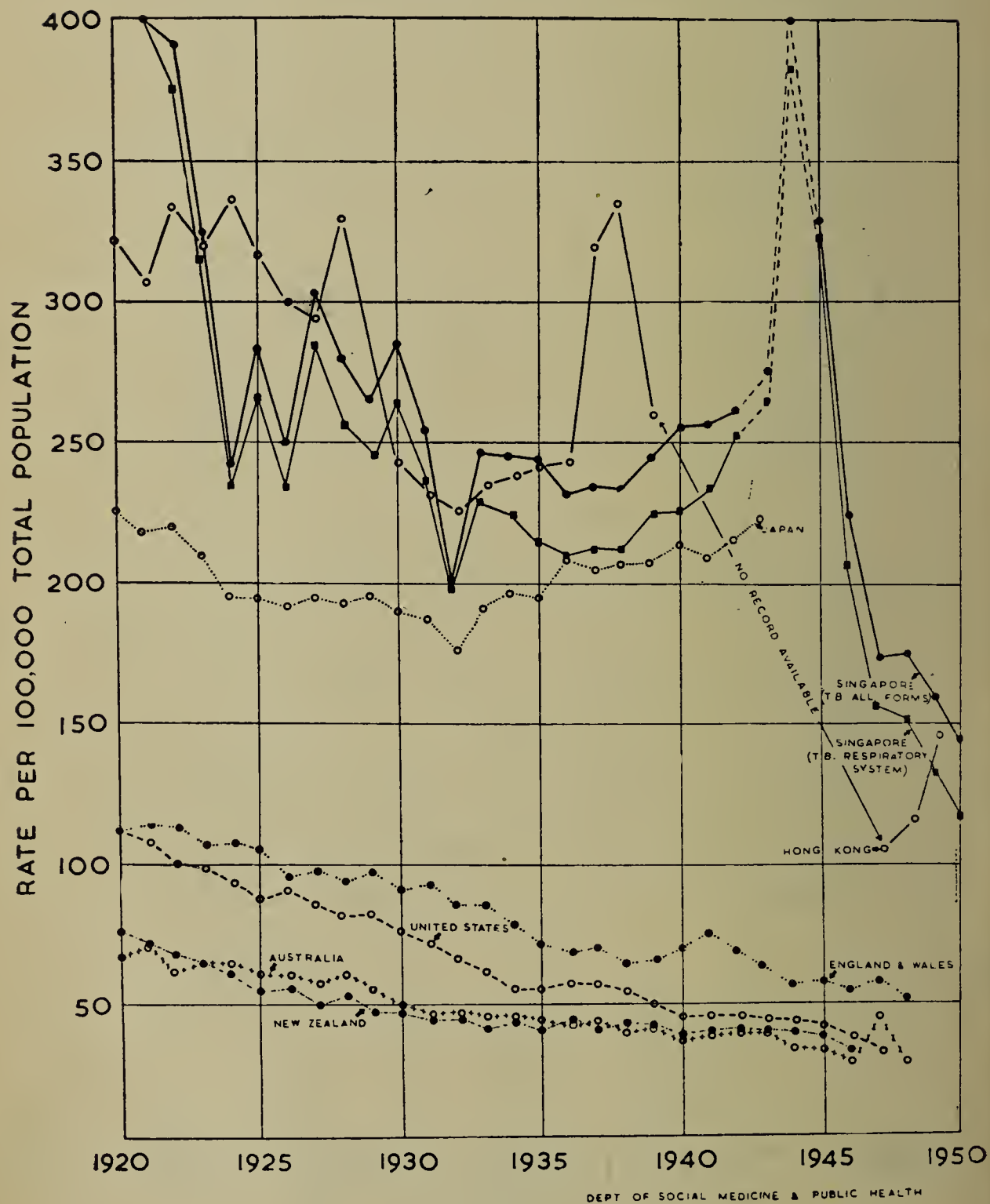


Fig. 7

MIGRATION STATISTICS BY SEA AND AIR DURING 1950

IMMIGRANTS

Race	ADULTS		CHILDREN		Total
	Male	Female	Male	Female	
European	16,403	7,150	1,618	1,303	26,474
Eurasian	162	139	48	42	391
Chinese	34,988	8,326	4,208	2,764	50,286
Malaysian	3,861	811	271	270	5,213
Indian and Pakistani	7,571	1,154	540	432	9,697
Others	1,986	472	105	98	2,661
Total, All Races ..	64,971	18,052	6,790	4,909	94,722

EMIGRANTS

Race	ADULTS		CHILDREN		Total
	Male	Female	Male	Female	
European	16,526	7,603	1,667	1,389	27,185
Eurasian	88	51	21	8	168
Chinese	41,927	7,820	2,409	1,511	53,667
Malaysian	6,622	1,618	757	745	9,742
Indian and Pakistani	13,229	1,432	769	659	16,089
Others	1,976	568	193	184	2,921
Total, All Races ..	80,368	19,092	5,816	4,496	109,772

CHINESE DECK PASSENGERS FROM AND TO CHINA AND HONGKONG, 1950

Country	IMMIGRANTS				Total	EMIGRANTS				Total
	ADULTS		CHILDREN			ADULTS		CHILDREN		
	Male	Female	Male	Female		Male	Female	Male	Female	
China ..	5,383	1,418	1,324	780	8,905	8,267	1,174	876	580	10,897
Hongkong ..	8,570	3,335	2,056	1,422	15,383	3,983	1,217	470	226	5,896
Total ..	13,953	4,753	3,380	2,202	24,288	12,250	2,391	1,346	806	16,793

PART II

THE HEALTH DIVISION

CHAPTER SEVEN

INTRODUCTORY

THE following extract from the Report on the Medical and Health Services of the Colony issued by Government and contained in the 1946 Annual Report is quoted because of its relevancy even today in regard to staff and accommodation. The ten-year Medical Plan has followed and has been accepted but its implementation is still awaited. That an adequate control has functioned so far through an improved organisation and the keenness and energy of the small staff available does not mean that it can prevail indefinitely under the growing tension of modern conditions:—

Preventive medicine must take its full and proper place in any medical scheme, however, as the old adage that prevention is better than cure was never nearer the mark than it is today when our coming generations are in such a depressed state of health. Any competent observer can soon satisfy himself on this point. Thus the need for first class school medical and dental services and a full-scale pre-school clinic scheme.

Infant Welfare services dealing with children up to one year of age are covered by the Municipal Commission within city limits. While a similar service was steadily developing before the war in rural Singapore, and much good work had been done in the schools, the Government organisation had no satisfactory accommodation. The time has come when we must do a good deal more in this direction if future hospitalisation is to be kept within the minimum limits indicated above. After some twenty years of rural maternity and child welfare work not one really up to date centre is in existence. Some function in old shop-houses, while one is held in a cooly line and another in a police compound. It is only the enthusiasm of the Public Health staff and the co-operation of the public which has enabled the existing service to carry on. Sixteen centres are proposed over the next five (later ten) years apart from one or two which local Chinese communities are proposing to build for themselves.

And nothing has ever been done for the pre-school child in town or country until the feeding scheme approved a short time ago started to function. These children will be dealt with in the special hospital and rural clinics envisaged, and in special units in the hospitals, as soon as sufficient staff and accommodation are available. This is a vital and essential field which must be covered at the first possible moment.

While pre-war there were seven Health Officers—three women and four men—to carry out examinations and treatment of school children, only two lady doctors are available today for this work for which no accommodation exists. As it is estimated by the Educational Authority that up to 100,000 children will have to be dealt with regularly in the school scheme in the not too distant future the existing state of affairs from the medical side can only be described as deplorable. Sufficient staff and clinics to deal with this problem cannot be long delayed without very serious results for the coming generations.

No school dental service exists at all. It is estimated that at least 75 per cent of our children suffer from dental caries. The sooner this service is started the better for all.

Re-organisation in the Rural Dispensary Service has already started by the provision of travelling dispensaries in the 1947 Estimates, and the gift of one by the Rotary Club of Singapore. Two static dispensaries exist at Bukit Timah and Paya Lebar. Three more are essential in the more outlying and densely populated areas.

With the money voted for 1947 it is hoped to complete the repair to most of the permanent anti-malarial drainage system necessitated by the damage caused during the Japanese occupation. It will then be necessary to continue a considerable programme of new construction for the more densely populated rural areas where large sums are being spent at the moment in carrying out open ditching and oiling. This work is bound up with sillage drainage in the villages where no means exist at present for the removal of large amounts of water. Village populations seem to have spread over the island during the last few years, and this fact in conjunction with the influx of Service personnel in new districts means a considerable increase

in the pre-war anti-malarial control. The estimates given, however, only cover anticipated civil expenditure in this connection. The Services are prepared to co-operate fully and the Singapore Public Health Conference is at work already on these lines. While malaria has been kept under reasonable control since the re-occupation by widespread and energetic but extensive temporary measures, a serious epidemic of this disease is always around the corner. So no relaxation in operations and expenditure is possible until the permanent scheme has been completed.

The Government Health Division covers rural Singapore, port and air quarantine, prevention and control, and the school medical and dental services.

The rural area of Singapore contains some 186 square miles of territory in which live approximately 270,000 persons. However a very large area in the centre of the island is occupied by a water catchment area, other large areas are occupied by the Services, including three large aerodromes, and a not inconsiderable portion of the rest is swamp, burial ground and rubber estate, so that the population is concentrated in a very much smaller area than the nominal 186 square miles quoted.

The most densely populated areas are Holland Road, Bukit Timah and Bukit Panjang, following the main road to Johore, Nee Soon and Sembawang; the heavily populated Serangoon and Paya Lebar districts and the coastal strips at Pasir Panjang and Siglap, to the west and east of the Municipal area.

The Chief Health Officer, Singapore, is a member of the Rural Board and advises the Board on matters of general policy. He supervises the work of the Rural Health Officers and co-ordinates their activities. The Health Department does all the anti-malarial work in the area and is in control of the scavenging and conservancy services. All building plans are scrutinised by the Health Officers and the Health Department employs the labour engaged in Rural Board duties. The Infant Welfare staff of the Health Department does all its work in the rural area, and the Schools Medical and Dental Branch in addition to its work in the Municipal schools looks after the health of the rural school children and advises on school buildings. The travelling dispensaries in the rural areas are run by the Health Department.

The staff engaged directly on Rural Board duties is as follows:—

Health Officer	...	...	...	...	1
Sanitary Inspectors	...	...	...	...	7
Technical Subordinates	...	...	...	...	31
Labourers: (a) Anti-malarial	...	...	...	...	218
(b) Scavenging	...	...	...	...	271
Drivers	...	...	...	...	5

The Health Department Infant Welfare service is staffed as follows:—

Lady Health Officer	...	...	...	...	1
Public Health Matron	...	...	...	...	1
Health Sisters	...	...	...	...	4
Health Nurses	...	...	...	...	11
Health Midwives	...	...	...	...	20
Health Pupils	...	...	...	...	5
Health Servants	...	...	...	...	22

In addition three school health officers, one health sister and five school health nurses, one hospital assistant of the schools branch and the schools sanitary inspector do much of the work in Rural Board area. Three hospital assistants and three drivers run the travelling dispensaries. There is a public dispensary with a hospital assistant in charge at Bukit Timah and another at Paya Lebar. Although this latter dispensary is actually in the Municipal area it draws

a large number of its patients from the rural districts around. The Schools Dental service, although a Singapore service, is as yet too small to reach the rural districts. A small school travelling dispensary operates under a nurse and a driver in addition to the above.

The work of the Port Health section has to be maintained both from the point of view of the protection of the Colony from dangerous infectious disease from outside and for reasons of international obligation. The same statement also applies to work at the airport but here our difficulties are complicated by an ever-increasing tempo in air services which demand more personnel to keep control functioning satisfactorily.

Next in order of importance comes the Rural Health service which at best can be described as on a slowly expanding care and maintenance basis.

The Infant Welfare and Midwifery section is keeping pace with the demands made upon it at the expense of a greatly overworked staff. There is a grave tendency for new recruits to this service to resign after a short term when they discover the extremely hard work, with little respite, to which they are committed.

The schools division has not kept pace with the demands made on it and the reasons for this are given in the appropriate section of this report. Such neglect may not be immediately apparent but it will show in the health of the adult population in a few years time.

Despite continued difficulties the public health has improved steadily from year to year so far since the end of the war. There are indications, however, that the limits of improvement have now been reached and unless changes are made in the direction of more modern methods of general control and of sanitation, keeping pace with the increasing population, there will be a tendency to serious deterioration in the next few years.

In 1949 the infantile mortality rate in the rural area was 54: in 1950 it was 60. Although the population is increasing the number of births in the rural area has shown a slight decrease—12,909 in 1950 as against 13,045 in 1949. It is not improbable that a number of births in the municipal area is referable to mothers who come into the town for their confinement. Any subsequent death of the infant would be reported in the rural area. Hospital confinements are becoming more popular and are more economical.

On the other hand our outmoded methods of sanitation are not in keeping with rural development and the infant mortality rate is a good index of the state of general sanitation. Water supplies, refuse disposal and night-soil disposal all influence infant mortality rates.

PUBLIC HEALTH CONFERENCE

Two meetings were held during the year under the chairmanship of the Director of Medical Services. These conferences are a post-war development arising from the period of the British Military Administration when all the health services of the Island of Singapore, both civil and military, were fully co-ordinated. Now all interested parties meet together in an effort to keep this co-ordination going. The members cover civil Government, Municipal, Navy, Army and Air Force, the World Health Organisation and the Federation representatives attending as observers. Any subject affecting the health of the whole community can be raised. All local public health problems are kept under constant review.

CHAPTER EIGHT

INFECTIOUS DISEASE IN RURAL SINGAPORE

FOR the second year in succession no cases of small-pox, cholera or plague occurred in the Colony.

POLIOMYELITIS

It might be of interest to review the situation with regard to poliomyelitis over the last few years before discussing the 1950 incidence of this disease in Singapore. In consequence this particular condition is considered on a Colony basis.

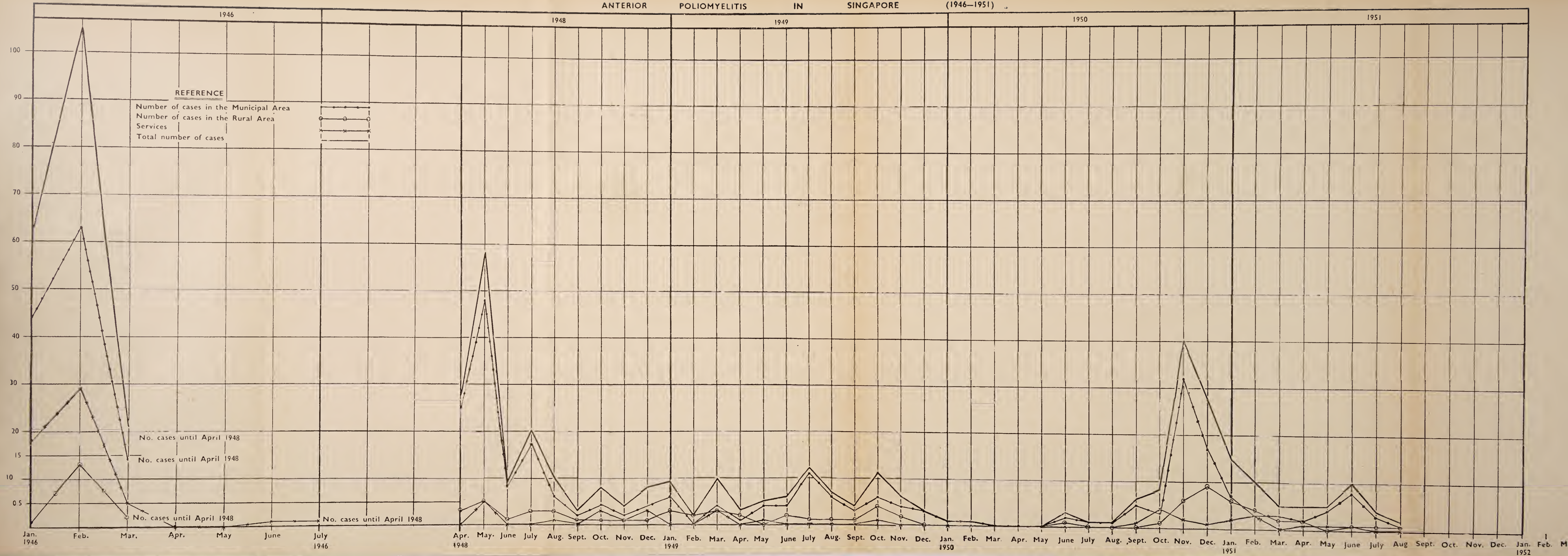
Acute anterior poliomyelitis has been present in Malaya for many years but has not attracted much attention until lately. In 1934-35 there was a mild outbreak which roused a slight passing interest. In the early part of 1941 four cases occurred in a school at Cameron Highlands, with one death, one mild paralysis and two complete recoveries. This caused a minor sensation and the disease was made notifiable for the first time. The presence of other cases in Ipoh, Tapah, Kuala Lumpur and Singapore at the same time seems to have escaped attention.

In 1945-46 there was a sharp outbreak of poliomyelitis in Singapore, particularly in the months of January to March. The incidence reached a high peak (33 cases) in the second week in February and then died away rapidly. There were two cases reported during the remainder of that year, one in June and the other in July. During this outbreak there was a total of 137 cases amongst the civilian population and a further 52 amongst Service personnel. In the civilian population cases were those of young children but the high incidence amongst adults in the Services was an unusual feature.

After the two sporadic cases in the Services in June and July no more were reported until the year 1948 when there was a sudden sharp outbreak in the months of April, May and June, with a peak of 58 cases in May. There was a subsequent rise to 20 cases in July and then the number reported fell away to between 2 and 10 cases per month for the rest of the year. This time the large majority of the cases were civilians residing in the Municipal area and the Services played a very minor part. This time the outbreak did not die away completely and for the rest of 1948 and throughout 1949 there was a steady rise and fall in the number of cases varying from 2 to 12 per month.

In 1950 the incidence declined and during the months of March, April and May there were no cases reported in Singapore. After that the number again began to rise and in October, November and December of that year there was another recrudescence of the disease with a high peak of 40 cases in November. Again the outbreak was mainly amongst civilians in the municipal area although the rural area showed a small rise with its peak delayed until December. The Services showed a minor rise and the occurrence of four serious cases in one officers' mess on the island of Pulau Brani within a fortnight showed how at times the infectious nature of poliomyelitis can be demonstrated.

ANTERIOR POLIOMYELITIS IN SINGAPORE (1946-1951)



The peculiar feature of the 1950 outbreak was the time at which it occurred. The two previous outbreaks occurred during the early part of the year, February 1946 and May 1948. In 1950 March, April and May were free from this disease and the outbreak occurred in October, November and December. Although it is difficult to make authoritative statements about how poliomyelitis is spread it is known the virus occurs in the naso-pharynx and in the fæces. The disease may probably be spread by droplet infection from the noses of mild cases or in the same manner as in any other bowel infection, by water, by contaminated food, by flies. Overcrowding in houses or close contact in messes and barracks would favour the first method of spread and general bad sanitation would favour the second method.

Respiratory spread would be favoured by overcrowding so that a greater number of cases per number of people would be expected in the municipal area than in the rural areas. This is found to be the case. According to the 1947 census figures the population of the municipal area is 2.6 times as great as that in the rural area. During the years 1948-50 there were 63 cases of poliomyelitis in the rural area so that a population of 2.6 times as great might be expected to have had $63 \times 2.6 = 164$ cases. In fact the number of cases in the municipal area was 239 over this period, a figure favouring the theory of respiratory spread. The special circumstances of each case would have to be examined with care before any definite conclusions could be arrived at.

In Malaya generally the sanitation is affected by the rainfall. In dry weather rubbish accumulates on the surface of the ground. Gentle rain makes this surface suitable for fly breeding and heavy rain washes it into earth wells and water courses. Alimentary infection seems to follow the rainfall. A graph giving the incidence of cases of poliomyelitis in Singapore together with the rainfall and the humidity shows no relation between the climatic features and this incidence, at any rate in the monthly figures. Again the Malayan housefly is attracted by household refuse and not by human fæces so that the infection of the house-fly is doubtful.

It had been thought that the outbreaks in the early part of 1946 and 1948 were related to some climatic feature. The outbreak in the late autumn of 1950 contradicts this view and no climatic feature can be discovered to account for this change in the time of the year or for the sudden rise in cases. So far as our present knowledge of the features mentioned goes, the change in seasonal incidence in 1950 cannot be explained.

DIPHTHERIA

A total of 49 cases occurred in the rural districts as compared with 47 in 1949, a morbidity rate of some 2 per 1,000 of the population. Whilst it is true that there is a tendency for only the more serious cases to be reported, diphtheria cannot be regarded as a disease of great importance in rural Singapore. This may explain the comparative lack of interest shown by the local population in diphtheria prophylaxis. Nevertheless it is probable that this figure does not carry quite the correct impression of the incidence of this disease as a large proportion of those admitted to hospital are seriously ill and this aid has only been sought as a last resource. That common expression *sakit sawan* (convulsions) undoubtedly includes some cases. The appointment of a Lady Medical Officer to the rural Infant Welfare Service has enabled a start to be made with preventive inoculations and since October 1949 some 2,799 children have been immunised although 3,968 children were presented for the initial injection. At

this rate the incidence of diphtheria should be greatly reduced in a few years time. Preventive inoculation has been a feature in the urban health centres for a considerable period.

TROPICAL TYPHUS

Only five cases of scrub typhus were reported from the rural districts as compared with ten cases during 1949. Compared with many States in the Federation of Malaya where a considerable increase in cases of tropical typhus has been noted in recent years, the incidence is extremely low in Singapore. However recent advances in methods of treatment have robbed this disease of its terrors. The preventive inoculations so popular a few years ago are not now considered to be of value.

CHICKEN POX

A total of 71 cases were reported from the rural areas in 1950. This disease sustains its nuisance value, as each case reported rouses the fear that small-pox has at last gained entry from the ring of infected countries by which Singapore is surrounded. Immediate investigation and careful diagnosis is required in every case in consequence.

ENTERIC FEVER

A total of 21 cases came to notice from rural Singapore during the year. The rarity of infections from this group of organism locally is surprising. Although the incidence is small these follow the usual monthly distribution in Malaya and occur during the seasons of heavier rainfall. This is what would be expected with a water-borne disease. Also flies tend to be more numerous when the soil is damp and the surface collections of refuse are moist. The commonly accepted theory that all typhoid fever is caused by food hawkers may not always be correct and leads to the ignoring of the much more important questions of general sanitation and distribution of water supplies. A sudden increase in cases in a definite area or among one section of the population should cause attention to be directed to the discovery of a hawker carrier, or other food source.

LEPROSY

A total of 81 cases were notified from the rural area alone in 1950, so that in spite of the great claims made for modern methods of treatment the incidence of new cases still remains as high as ever. It is possible that the success of treatment so widely reported is bringing out lepers from hiding in the hope of cure and that in a few years time the incidence of new cases may be reduced. Nevertheless the problem created by this disease today remains a major one.

CHAPTER NINE

HYGIENE AND SANITATION IN THE RURAL AREA

MOSQUITO CONTROL AND MALARIA

WHILST the figure of 88 cases of malaria for the whole of rural Singapore in 1949 was considered to be very satisfactory there was still a certain feeling that this figure could be bettered. Accordingly in 1950 extensive surveys were done in all areas to discover if these doubts could be justified. In many controlled areas a certain amount of breeding of dangerous anophelene mosquitoes was discovered. The main cause was that the same amount of post-war oil used on any area was not giving one hundred per cent perfect results owing to a falling off in the quality obtainable. The oil consumption was immediately stepped up to a compensatory level and in 1950 in consequence there was hardly any malaria. Only two local infections have occurred and there have been no reported cases from the controlled area.

As an experiment a change was made in one zone from the more expensive oil commonly used to a cheaper quality. This latter material whilst of less spreading power is of greater killing power and also has the pre-war quality of causing the grass at the sides of the drains to turn brown thus facilitating checking. The experiment proved successful and the use of the cheaper oil will be extended in 1951. In addition we are again adding D.D.T. to the oil we use.

Too much complacency in the present position is highly dangerous, however, as there is the present general low incidence elsewhere to be remembered. Also there has been little change in the manner of land utilisation apart from the building of houses, and this alone tends to stabilisation of infection at a low level.

Complaints of nuisance from ordinary mosquitoes arising in Government quarters in the town and from the rural area are still numerous and are dealt with as far as circumstances permit. Many such complaints arise from persons who exercise the most scrupulous care in seeing that their own compounds are free from any breeding, yet on inspection the discovery of tins and other breeding places is common in such compounds.

Removal of lallang and blukar periodically from Government land surrounding houses has done much to help, as all receptacles capable of holding water are disposed of at the same time.

Each sanitary district now has a technical assistant who is responsible for all oiling and maintenance work in the district. Under him are employed oiling gangs and maintenance gangs. The district sanitary inspector still remains the over-all local authority to whom the technical assistant and his gang are responsible and in addition he exercises direct authority on all construction and rehabilitation going on in his district.

Checking is done constantly by the Rural Health Officer, the Chief Sanitary Inspector and the Central Laboratory Staff.

Anti-malarial works are permanent and temporary.



Public Relations

Anti-malarial Well



Public Relations

Permanent Anti-malarial Works

Permanent

New subsoil drains measuring 3,782 yards were constructed and 7,007 yards were relaid. 6,161 yards of open cement drains were repaired. Much of this work was made necessary by the neglect or damage during the years of enemy occupation. Two new sluices were erected.

Temporary

Earth drains measuring 777,878 yards (442 miles) had work performed on them during the year. The keeping of earth drains free from grass and weeds in a tropical climate is never-ending labour. 9,758 yards of earth drains were dug (5½ miles). These earth drains were kept free of mosquito breeding by brush oiling, and by using this method a considerable saving in oil was effected with no loss in efficiency. 42,654½ gallons of oil were used as against 35,962 gallons in 1949.

In addition to the work done by the Health Division the Services control large areas in and around their property and a considerable amount of permanent drainage has been done by them. The Department advises the Services on these matters. This anti-malarial work has a very beneficial effect on those districts bordering on the lands occupied by the Armed Forces.

The population of the rural area is increasing and urbanisation is proceeding apace, so that an increase in both permanent and temporary constructional measures may have to be contemplated in the not too distant future.

SEWAGE AND REFUSE DISPOSAL

Scavenging

The same outdated methods of refuse disposal still continue. The refuse is collected and carried by hand carts to the local incinerators or to batteries of large rubbish bins, and from these collecting points it is conveyed to the disposal point by a contractor's lorry. Some improvement has been attempted. It has been the custom for scavenging labourers to work in isolated units, or scattered parties, and the mandore or overseer spent much time bicycling from place to place endeavouring to supervise the work. Where possible the gangs now work as one unit and make a 'clean sweep' through an area under constant supervision.

In some of the smaller villages one or two labourers do an excellent job in keeping the main streets and drains clear of rubbish with little supervision. It is only the unsportsmanlike senior officer who walks down the back lanes who feels less happy about the scavenging situation. The labour force, however, is under strength and when a labourer can get \$4 to \$5 per day for work on a rubber estate it is difficult to recruit from those few members of the public who are willing to do scavenging work.

Final disposal is by incineration, composting and tipping. The incinerators in use are mostly small and scattered throughout the smaller villages. Composting is carried on at Bukit Timah, Dunearn Road and in the Changi district. It is a very satisfactory method of refuse disposal and can be combined with night-soil, or not, as required. The difficulty is to dispose of the final product. The local agriculturalist is conditioned to the use of fresher material and will not trouble to carry the compost away. The chief demand comes from householders interested in horticulture. The Dunearn Road product is not made from night-soil so that it may be used by local gardeners without fear of defilement.



Public Relations

Permanent Anti-malarial Works (sub-soil drainage of open stream in ravine)



Public Relations

Parapet Well, Pulau Tekong

Sanitary inspectors are most keen on what they describe as 'controlled tipping'. It consists of filling swamps with refuse and spreading a thin layer of earth on top. The liberal use of D.D.T. powder sprinkled on the top of the refuse daily, using a sieve for spreading, has so far controlled flies, but should our flies become resistant to D.D.T. this cheap form of filling may have to be discontinued however useful it may be as a permanent anti-mosquito measure.

The carriage of refuse by contract is unsatisfactory. Recommendations have been made for departmental removal.

Night-soil Removal and Disposal

The scheme for departmental removal of night-soil from Bukit Panjang and Bukit Timah came into operation in 1950 with two large rehabilitated septic tanks and three night-soil lorries. The disposal tanks and their water supplies proved inadequate, however, and recourse had to be made to some extent to trenching. At Bukit Timah composting relieved some of the load. Elsewhere the old system of removal of night-soil by contractors continued. Any careful examination of the working of this scheme reveals that this method of removal is really a legalised collection for use on vegetable gardens. The contractors tender for a monopoly in this valuable material. The method does, however, ensure that the night-soil is removed from the latrines. The system of direct removal and disposal of night-soil at Bukit Timah and Bukit Panjang was an effort on the part of the Rural Board to remedy the defects in the contract system, but this year the idea of water-borne sewage in the larger villages has taken root and it is possible that in the not too far distant future the larger villages will have their buckets replaced by W.C's. Unfortunately the agricultural population does not live in villages but in small houses on their holdings. Rural sanitation will always be a problem in such circumstances.

WATER SUPPLY

The high hopes that the arrangement with the Municipality for the extension of water mains to all parts of the rural area would result in the laying of pipe lines along the Jurong Road and Tuas this year have not been fulfilled. This has resulted in a movement for the creation of a Water Board in Singapore to look after the interests of the entire Island. Certain minor main extensions have been made during the year. So many wells are still necessary unfortunately. At the western end of the Island the soil is of a very porous nature and even very deep wells cease to function during the drier portion of the year.

Where there are permanent anti-malarial works, water supplies are always provided by making use of the water from the subsoil pipes. In some areas 'anti-malarial wells' form the main source of supply. It is pleasing to note that where there is a civilian population adjacent to a ravine which is being drained by the Services anti-malarial wells are put in to afford a water supply, an extra expense which the Services are not bound to incur.

OFFENSIVE TRADES

The great feature in 1950 in this respect has been the rapid expansion of the rubber industry in Singapore. Apart from the manufacture of local rubber, considerable amounts of raw material have been imported from Indonesia and this

foul-smelling, fermenting substance has been transported through the town and country-side to the smoke-houses pervading the surroundings with an odour of corruption. The increasing demands for smoke-houses, often in residential or semi-residential areas, led the Rural Board to set aside a special area for their erection. This area lies to the south-west of the Island and is one proposed for industrial development. The problem of extension to an existing factory in an area where its presence is undesirable remains.

To try and control the spread of industry and unplanned housing development whilst the major planning of Singapore Island is in progress the Rural Board has obtained powers to control the type of building required. Now all building plans have to be passed by a special Sites Committee before building is allowed.

The Rural Health Officers, with very able assistance from the Department of Chemistry, endeavour to advise industrial concerns on methods for protecting their staffs from the hazards of industry and in the satisfactory disposal of industrial wastes.

Since the Japanese occupation the slaughtering of pigs in unlicensed slaughter houses has been going on throughout the rural area but 1950 saw the removal of all such animals to the Municipal abattoirs. The question of making exceptions on Pulau Tekong and Pulau Ubin received consideration however. Constant efforts have been made to improve the pigsties and to remove them from residential districts. These efforts have met with moderate success. The erratic spread of residential property into the rural area complicates the problem for both the pig breeder and the administration. The breeding of pigs is an essential factor in the provision of food for Singapore and unless the population is to be supplied with pork from outside sources in the future it may become necessary to protect the pig breeder and agriculturist from encroachment.

The problem of the small dairy and cattle-keeper has become more prominent recently as the Municipality have been removing these people from their areas and they have to settle within the jurisdiction of the Rural Board. As they have little capital to expend on proper premises a difficult situation arises. As a piped water supply is most desirable for a dairy the competition between residential areas and the supply of food occurs again. This problem is receiving attention.

HOUSING

The proper housing of the population is one of the greatest health problems which faces Singapore. The problem is made more difficult as there is no planning authority with powers to plan towns and villages, and to ensure that development takes place on proper lines. Each land owner has his land laid out to suit himself and the result is a considerable confusion. It requires constant effort on the part of the Rural Board to prevent every main road being lined with inferior shophouses from end to end. Whilst there was considerable development of the more expensive bungalow type and cheap shophouses in the early part of the year, the poor man had still to build for himself. To facilitate the erection of cheaper types of houses by the less well off, the Rural Board produced type plans which can be bought for \$1 each and, provided the site is approved, these plans automatically pass. Scale models are being built so that the prospective house builder can choose his type and know exactly what sort of house he will get. Unauthorised building, generally of an insanitary type, still continues, however, although great efforts are being made to control it. The world

situation reacted very adversely on building activities during the latter part of the year. The Building By-laws of the Rural Board which have been under revision for a long time were at last brought to a state of completion in 1950 and there is every hope that they will become law in the early future.

The newer types of labourers' quarters erected by Government during the year are a great advance on any previous construction of this kind and compare extremely favourably with private enterprise of this nature. They afford much better living accommodation than the majority of shophouses. These new houses can be made into real little homes.

The shophouse is one of the greatest hinderances to the establishment of decent living conditions with which the Health Department has to contend. In a country which depends on the natural movement of the external air for ventilation and comfort the external openings for the admission of light and air should be down the long sides of the buildings. In a shophouse the very reverse is the case and in addition the long shape, with a narrow frontage, permits of a large number of houses within a small amount of open space. The fight for the recognition of a minimum width of twenty feet has been waged throughout the last two years and at last some results are beginning to appear in recent layouts. But more stress on greater frontage in proportion to depth is what is really required. With few exceptions shops are family businesses, with the owner living on the premises. All available space is sublet. As a result our towns occupy a much smaller area than towns of an equal population elsewhere.

The incidence of pneumonia and pulmonary tuberculosis is influenced very considerably by congestion of population in ill-ventilated premises.

FOOD IN RELATION TO HEALTH AND DISEASE

During the year the regulations under the Food and Drugs Enactment have been revised and improvements in keeping with modern practice introduced. The difficulty in framing such legislation as this is to avoid regulating away the products of conscientious and cleanly countries and yet to keep out the products of their insanitary and unscrupulous competitors. An aggravation, and a serious one, to the control of food sold to the public was created in 1950 when police assistance in the control of hawkers was withdrawn. The increase in acute anterior poliomyelitis in recent times may not be without significance in this connection. Every shophouse and every hut where food is prepared for sale to the public is a food factory, and an approach to the problem on these lines may offer a solution of the present difficulties. Quite apart from the actual food factory one of the biggest problems at the present time is the difficulty the average man, or family, has in preparing food in his own home owing to the housing shortage and lack of kitchen space. There is room for the large eating house where the ordinary person can obtain a meal at a reasonable price.

All food factories and eating houses are inspected by the officers of the Health Division and recommendations made for licensing, or for works to be done before licensing. A considerable number of applications have to be refused on the grounds of insanitary premises. Even in cases where the building can be made perfect the sanitary conscience of the workmen, and even of the proprietor, is often primitive, and dirty habits can render the most perfect structure and apparatus ineffectual. True improvement will come when the public

refuses to patronise unclean premises. No hawker who prepares his goods in an insanitary hovel, or in the over-crowded kitchen of a shophouse, should properly be considered for a licence.

Where a large section of the population lives in cubicles with no cooking facilities and is forced to 'eat out' the eating house should meet the demand rather than the street stall. Nevertheless the hawker who carries round supplies of fresh meat, fish, and vegetables to districts *remote* from public markets serves a useful purpose and is a boon to the busy housewife and mother. Proper containers for carriage should be more widely used.

There is only one public market in the rural area and this was opened in 1949 at Serangoon. The success of the Serangoon market has encouraged the Rural Board to consider the erection of markets in other areas. Wholesale markets or collecting stations are contemplated in fish and vegetable producing centres.

The private markets are commercial ventures and little of the profits are expended on cleansing or proper stalls. The sooner such structures become public property the better.

All markets continue to be the haunt of numbers of unlicensed mangy dogs, and shooting dogs in such areas is impossible. Other methods of removal have been suggested by the Board and it is hoped that this nuisance will be removed shortly.

Eating houses	...	...	...	...	9,248
Coffee shops	...	...	...	...	1,772
Butcher shops and slaughter houses	...	...	...	...	386
Fishmongers	...	...	...	...	2,725
Grocers	...	...	...	...	4,034
Markets	...	...	...	...	2,575
Milk vendors	...	...	...	...	1,525
Bake-houses	...	...	...	...	1,538
Hawkers	...	...	...	...	5,291
Total Food Inspections					29,094

TRAINING OF SANITARY PERSONNEL

Teaching of public health was carried out by the division under the auspices of the Faculty of Medicine and the Royal Sanitary Institute. For medical students one lecture and one demonstration a week is given during terms. In 1949 the Royal Sanitary Institute course was lengthened to nine months—the six months course in 1948 being only an interim post-war phase. The course was divided into two parts: the first three months covering the subjects of basic science, public health law, anatomy, physiology, elementary bacteriology and parasitology; the second part of six months duration dealing with more practical aspects. Students who failed Part I, except in special circumstances, were not permitted to proceed to Part II. It is too early to comment on this change but it can be said even now that the better students benefitted in that those who could not make the grade were weeded out in the first three months.

Twenty-three students entered for the course, eighteen of whom passed.

CHAPTER TEN

MATERNITY AND CHILD WELFARE IN THE RURAL AREAS

THERE are now eleven Infant Welfare Centres in the rural area with a staff of nurses and midwives, and four smaller centres with a resident midwife only. Regular clinics are held at twenty-four other places in addition where there is no resident staff. This makes a total of thirty-nine now as compared to twenty-two in 1947. The pre-war policy of conducting this very important work from temporary buildings and even in the open is not considered suitable under modern conditions and for an expanding service. Only three small centres have ever been provided with proper Government buildings so far and the Medical Plan seeks to remedy this state of affairs.

Late in 1949 a portion of the two decrepit shophouses which housed the staff and clinic at Bukit Panjang collapsed and examination by the Building Inspectors of the Rural Board resulted in the buildings being condemned as unfit for human habitation. This clinic was then without a home. Fortunately this unsatisfactory state of affairs had not to continue for very long. The general public of the Bukit Panjang area subscribed most generously to funds for the erection of a new centre. This new building was opened by the Honourable the Colonial Secretary in May 1950. So at last one centre and its staff are now well housed.

Early in 1950 the Military Authority abandoned a camp with wooden and asbestos buildings at Yio Chu Kang Village. In the scramble for the abandoned property which ensued the Health Department managed to rent half the old officers' mess. Various alterations and additions were made with departmental labour, and the decrepit shophouse previously used for the clinic and staff in this area moved to much better premises also.

At the 10th mile Jurong Road, the P.W.D. erected a waiting shed for the mothers and children. Previously they had to stand about in the sun, or crowd into the small clinic there in case of rain.

During 1949 and 1950 the Rural District Committee of Bukit Timah made gallant attempts to gather sufficient funds for the erection of an Infant Welfare centre and quarters for a midwife at Tuas on the West Coast of the Island. Although nothing very elaborate is required one of the difficulties is that a building which is to be presented to Government has to conform with certain minimum standards, otherwise maintenance would amount to rebuilding within the course of a few years. These conditions make the Medical Plan in this respect a real necessity.

A new departure in maternity and child welfare work in 1949 in the rural areas was the appointment of a Lady Medical Officer to take charge of the work. Ever since the inception of the scheme in 1927 a public health matron had been in charge and stress had always been laid on the educational and preventive aspects of the work, treatment of minor ailments and first aid being incidental. The welfare centres were regarded as health centres where help and advice to keep children fit was given, and not as dispensaries for sick children. The appointment of a lady doctor does not mean that undue emphasis will be placed on the curative side of the work however; active preventive measures will be pursued. Thus diphtheria immunisation has been started and more will be done in ante



Dr. Lawe

Rural Coastal Village



Public Relations

Bukit Timah Infant Welfare Centre

and post-natal care for mothers. For this purpose the rural area is divided into three sections: west, central and east, each in the immediate charge of a Health Sister who attends the main sessions at each clinic in turn. The western section includes the islands of the South-west Coast and the eastern section Pulau Ubin and Pulau Tekong.

At the beginning of 1950 one of the Infant Welfare Department Sisters (local) went to England on a U.N.I.C.E.F. scholarship to take the course for the Health Visitors Diploma. That she passed the final examination with credit can be recorded with great pleasure.

A local nurse who had spent two years in Australia studying under a scholarship generously given by the Australian Ex-Service Association, joined the staff early in 1950, and has demonstrated in a most able manner the benefits which she received during her course of studies. Still another health nurse proceeded to Australia in 1950 to undertake a similar two year course of instruction. Not only do these women who proceed abroad benefit from the technical education received, but they return with a broadened outlook on affairs in general. This has an undoubted influence for good in the community in which they work.

Like other divisions of Government service Infant Welfare suffers from staffing troubles. In a section staffed very largely by intelligent and hardworking young women, casualties through marriage tend to be high, and whilst married women may and do remain in the service, residence in an outlying district is very often not compatible with married life. This usually means a loss to the Department. There is also a difficulty in recruiting female health servants as these come mostly from the 'amah' class who are not generally local born, and who can often obtain a higher salary in private service. Locally born women are not attracted by this work and can seldom be recruited.

In response to demands from the local population new clinic sessions are now held on Pulau Semulon, at Tanjong Penuru and at Kampong Berih. Pulau Semulon is one of the inner group of islands off Tanjong Kling. Tanjong Penuru is on the coast beyond Pasir Panjang, but the approach by land through a mangrove swamp is so bad that it has to be visited by sea taking advantage of the new motor launch now at our disposal. The clinic at Kampong Berih is held in the Malay School for this district and serves an area to the west of Lim Chu Kang Road. There are certain areas on the west coast where the villages are very difficult of approach by land. The coming into service of the new launch enabled the Lady Health Officer to pay an exploratory visit to this area in December 1950 and arrangements have been made for regular visits to the two largest kampongs.

In spite of staffing difficulties the Department's maternity service expanded further during the period under review however. Nurses and midwives were directly concerned with the birth of 8,295 infants in the rural areas of Singapore out of a total of 12,909 births. In 4,152 of these cases the actual birth was conducted, but in 4,145 cases the baby was born before the arrival of the midwife. This was due to the inability of the staff to be in two places at once or due to the difficulties involved in reaching the house, particularly if the case occurred at night. Increased staff and better transport would help to solve this difficulty but as many houses are situated well off the roads it would not be a complete solution. As a rule the husband, or some near relative, calls for the midwife, and often provides such transport as is available, and acts as an escort at night. The aim is to see that each Sister has a car and that each nurse or midwife has at least a bicycle at her disposal, where a common vehicle is impossible.



Public Relations

Bukit Panjang Infant Welfare Centre



Public Relations

Infant Welfare Centre, Jurong Road, 10th milestone

Even if our full complement of 26 midwives had been always available it is obvious that the maternity staff is grossly overworked, and if an efficient service is to be supplied to meet the demand there must be a large increase in the number of midwives. This is not a service where the ideal of an eight-hour day can be applied. The master in this situation is the unborn baby and it cannot be concerned in collective bargaining until a later date in its career. So far as is possible each midwife, or health nurse, can count on alternate weekends being free to her. As there are 20 midwives in the Government service the number of births dealt with averages over 34 per month per person. This is far too many for real efficiency. At present it is inevitable that many babies are born before the midwife arrives and the number of cases to be seen makes proper attention difficult. Each case should be visited every day for ten days and instructions given in the care of the baby, as well as the necessary attention to the mother. If each visit took half an hour, including travelling, each midwife would have to work fifteen hours on every day of the month, apart from time spent at the actual birth. There are 36 qualified private midwives in the rural area but their functions are governed by economic factors. The total expenses incurred by a Malay family employing a qualified midwife are up to \$200 and an Indian labourer will withdraw \$70 to \$100 from the co-operative society for expenses in connection with a birth without employing a qualified midwife at all. It is true that this expenditure covers certain religious and semi-religious observances, but the fact remains that these expenses are too heavy.

The teaching of midwives has been in the English language only, and the result is that far too large a proportion are Chinese. In the Health service out of 20 midwives 17 are Chinese, 2 Malays and 1 Indian. The Health Department is trying to bring about changes in this direction so that a greater proportion of Mohammedan and Hindu women can be trained and employed as midwives. There is some difficulty in obtaining suitable women for training. In the meantime the unqualified *bidan* will continue to ply her trade although officially there are only three such women left in the rural area.

Apart from the work done by the midwives special clinic days are held at each large centre and pregnant women attend the ordinary clinics at the sub-centres. Difficult labours and complications of pregnancy can so be discovered and dealt with and precautions taken accordingly. Since the appointment of a Lady Medical Officer to this branch this side of the work has greatly increased in importance. Post-natal complications are dealt with in the same way. Two more Lady Health Officers will become necessary as this work proceeds.

When not engaged at clinics the health nurses are employed in visiting the women and children in their homes.

The following table gives a resumé of the 1950 work in this respect:—

Maternity and Child Welfare:

(a) Homes visited—

(i) Nurses	...	...	...	...	28,834
(ii) Midwives	...	...	...	...	47,101
(b) Cases seen at home	...	...	...	...	77,611
(c) Nursing visits by Midwives	...	...	...	...	37,087
(d) Confinements attended	...	...	...	...	8,295
(e) Mothers in labour sent to hospital	...	...	...	...	279

(f) Clinics—

(i) Infants	...	...	...	98,430
(ii) Children over a year	...	...	...	57,687
(iii) Ante-natal Mothers	...	...	...	26,006
(iv) Post-natal Mothers	...	...	...	13,044
(v) Primary Vaccinations	...	...	...	10,811

Free Milk Distribution:

(a) Feeds to Mothers	...	...	...	139,960
(b) Feeds to Children	...	...	...	552,483
(c) Powdered Milk used (in pounds)	...	...	...	21,793

The Lady Health Officer holds special clinics at each of the larger health centres in turn and abnormal pre-natal, or post-natal cases are referred to her from the surrounding districts. She also advises and treats women and young children who are suffering from more serious diseases other than those connected with child birth. It is true that this is a function which is really outside the sphere of infant welfare work, but in many cases no other medical attention is available, and unless this service is given the confidence of the population is lost. A woman to whom every medical care is given and whose children are cured of sickness is much more likely to listen to advice and instruction than one who is told to go fifteen miles to a hospital trailing five small children along with her because she cannot leave them at home.

The advance in diphtheria immunisation has been slow. 3,968 children received a first injection but only 2,799 returned for the second injection to complete the course. Unfortunately the great labour performed by the staff in the maternity field leaves them little time for propaganda.

CHAPTER ELEVEN

RURAL TRAVELLING DISPENSARIES

THE three travelling dispensaries dealt with 14,955 new cases with 18,501 repetitions of treatment and 6,314 school children, a grand total of 39,770 treatments given in the year. Two new smaller travelling dispensaries were obtained during the year and one ancient vehicle went out of service. 1951 will start with four dispensaries, one of which will be used entirely for the treatment of school children in outlying regions, thus making the other three vehicles available for more stopping places in the rural area. Also a new motor launch was brought into service in November and a floating dispensary will be available in 1951 for a weekly service to all the islands with more medical aid to isolated coastal areas difficult of access by land. Such transitory aid may not be the ideal but it is much better than nothing in areas of scattered population.

There are three static dispensaries serving the rural area at Bukit Timah, Paya Lebar and Pulau Brani. The Paya Lebar Clinic is situated just within the Municipal Area but it serves a thickly populated section outside this limit in addition. Part of the dispensary building at Bukit Timah is used as an Infant Welfare Clinic and the Paya Lebar Dispensary is also used for clinical sessions. While actual venereal disease is treated at the clinics of the Social Hygiene Branch situated in the town a special travelling dispensary is also now in use in this connection.

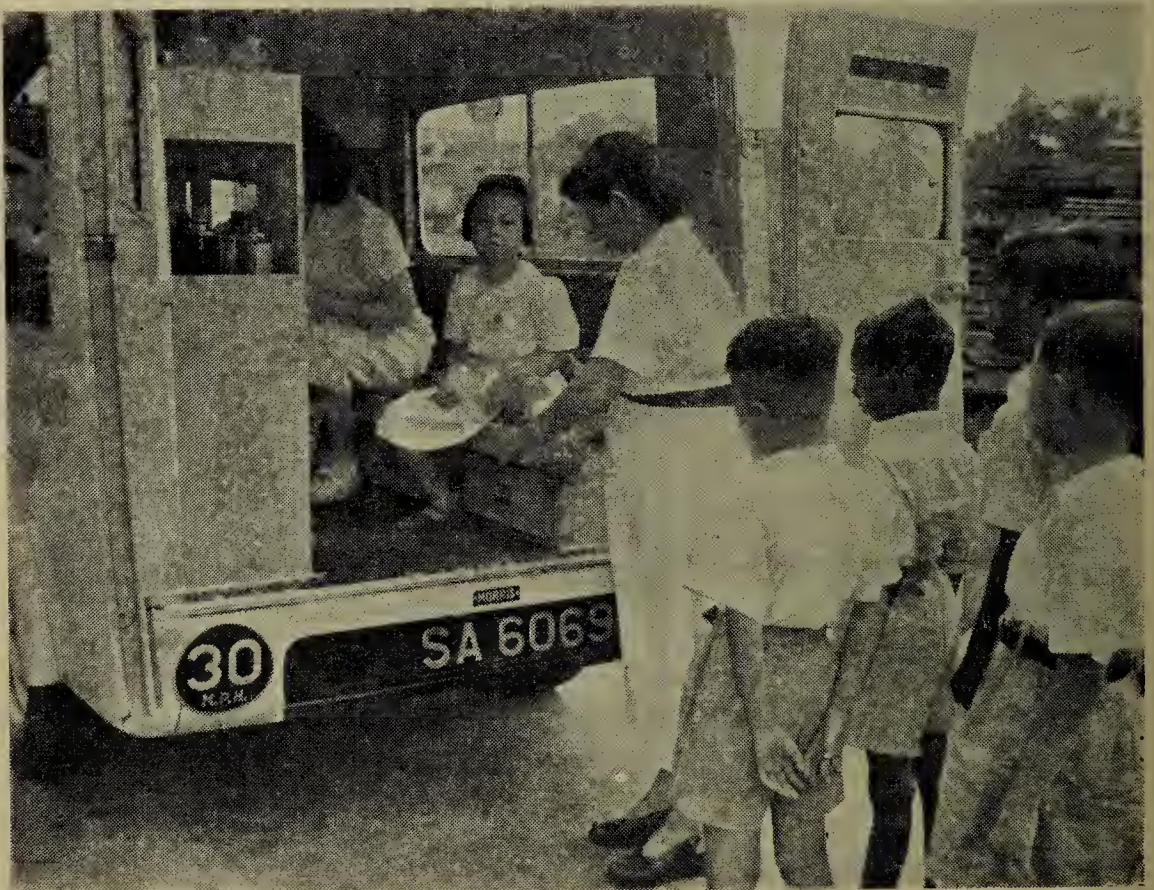
Whilst it is not desirable that Infant Welfare centres should be used as venereal disease clinics because of the effect on public opinion, it is quite proper that such cases amongst the normal attendances should receive proper advice and attention as a routine measure of ante-natal control.

There is a growing demand for an extension of the static dispensary system over the Island and it may be necessary to extend the limited number of such places noted in the Medical Plan in consequence.



Public Relations

Post-natal Clinic



Public Relations

Travelling Dispensary

CHAPTER TWELVE

PORT HEALTH AND QUARANTINE

ALTHOUGH many more ships were inspected at the quarantine anchorage this year than in 1949, fewer passengers landed in Singapore due to:—

- (1) the war and unsettled conditions in China;
- (2) a stricter enforcement of the visa regulations by the Department of Immigration;
- (3) the limiting of the passenger licence of certain ships sailing between India and Malaya to Penang only.

The above factors together with the freedom from major infectious disease of most of the China ports during the greater part of 1950 was reflected in the greatly reduced number of passengers sent to the quarantine station at St. John's Island.

With the increasing incidence of small-pox in the neighbouring Indonesian territories a greater vigilance was kept on ships arriving from these ports, but despite this a sailing *prahu* from Pontianak managed to slip into the harbour with a case of small-pox aboard. Had it not been for the co-operation of the Boarding Officer who informed us in time of her arrival the case and contacts might have landed and initiated an outbreak of this disease. On receipt of information of the arrival of this vessel it was boarded promptly and the case and contacts, all members of the crew, were isolated at the quarantine station. Within a short period of the isolation a second case developed. Incidentally all these men were in possession of a 'valid' international vaccination certificate.

The health control of the numerous junks and small craft is very difficult, particularly with the limited port health staff and absence of a proper quarantine anchorage for vessels of this size. This serious breach in our quarantine chain has been pointed out in previous years' reports but unfortunately the position remains the same. In consequence increasing vigilance has to be exercised. Even under the best of conditions the control of these vessels would be a difficult problem but with major infectious disease surrounding Singapore extreme care is essential.

The port of Tandjong Priok (Djakarta) was declared infected with plague on 24th August, 1950 and strict measures were enforced on ships, crews and passengers arriving from there. However, the outbreak was limited to one case and the situation soon became normal.

In view of the proximity of these neighbouring infected countries it was decided, in consultation with the Federation Government, to discontinue the granting of 'T.O.' (T.O. = code signal denoting ship has already been cleared in one Malayan port and will be exempt from quarantine in other Malayan ports) permits for ships coming from ports of one or two days journey from Malaya.



Dr. Lawe

Island Health Launch



Public Relations

School Clinic

Due to improved organisation by the Pilgrim Officer, the work of the Port Health Department was lessened when the pilgrimage to Mecca commenced this year. Almost all pilgrims were in possession of the requisite health papers so inspection at the time of embarkation was simplified. Further, the rules governing the increased accommodation from 16 square feet to 20 square feet per pilgrim, together with the altered and improved diet, made conditions much more tolerable for these people.

The World Health Organisation reports that no direct official epidemiological intelligence has been received by it from Communist China ports since April, 1950. So for information we are dependent on bills of health carried on ships.

The following is a summary of the work carried out:—

	1950
Number of ships from infected ports inspected and cleared ...	1,889
Tonnage	4,854,742
Number of passengers inspected on ships at quarantine anchorage:	
(a) landing	45,746
(b) in transit	90,876
Number of passengers quarantined on St. John's Island ...	8,658
Number of Bills of Health issued	6,281
Number of ships fumigated and issued with deratization certificates	87
Number of ships issued with deratization exemption certificates	222
Number of rats destroyed during fumigation and examined bacteriologically—	.
(a) destroyed	921
(b) examined	178
Vessels visited to inspect corpses	21
Permits issued to import, export or tranship coffins containing remains	68
Pilgrim ships with pilgrims—	
(a) ships	2
(b) pilgrims	1,153
Certificate to accompany goods	78
Disinfection of infected vessels	1
Inspection of Bum Boats	151
Inspection of Water Boats	16
Vaccinations and inoculations performed at North Canal Road Dispensary—	
(a) small-pox vaccination	15,500
(b) cholera inoculation	18,361
(c) T.A.B. inoculation	151

The real difficulty with Port Quarantine work in a place like Singapore is its proximity to so many different and difficult areas in a zone subject to so much international tension. Thus something may happen any day demanding a rapid extension of the operations in progress, and this necessitates a constant readiness and the facility to meet any emergency.

The Quarantine Station still remains deficient in modern accommodation but nothing can be done in this connection at present as the Prisons Department uses half the existing camps to accommodate detainees. The greatest number admitted for health reasons on one day exceeded the 2,000 mark.

CHAPTER THIRTEEN

AIR HEALTH

THE total work done by the Air Port Health Officers increased by about one third in 1950 as compared with 1949. In 1949 there were two airports, the main civil airport at Kallang and the R.A.F. airfield at Tengah where the heavier civil craft landed. At the end of March 1950 Tengah airfield ceased to accept civilian aircraft and all commercial planes landed at Kallang. This should have made the work of the airport health officers easier as a great deal of travelling was eliminated, and for a short time such was the case. However, the increasing tempo of air travel made it necessary to open Kallang Air Port for 24 hours a day if Singapore was to remain in the front rank as an air port.

The return of a woman officer from leave at this time enabled us to meet the demand for extra staff to maintain a 24 hour service by posting as a Port Health Officer, a most unusual post for a woman to hold. The experiment was not an unqualified success but it bridged the gap until a man became available for this work.

One of the main difficulties of airport work is that many important people travel by air and they are met on arrival by other important persons and by the Press. It is necessary that the Health Officer should see all passengers before they make their contact with the public and this restriction is found irksome by the less important by whom any regulation is considered as a denial of personal privilege. So considerable tact and force of character is required to perform airport health duties with the minimum of friction.

The present airport buildings were not designed to cope with the present volume of traffic and plans for alterations to meet present conditions are under consideration. Accommodation for passengers from aircraft straight to doctors and for outgoing passengers is essential.

The Airport Health Officer also interests himself in the general sanitation of the airport area and pays particular attention to the elimination of breeding places of *Aedes* mosquitoes, the carriers of yellow fever. The accidental infiltration of yellow fever is a constant dread and one against which the Health Authority has to be constantly on the watch. At present Malaya is protected by the buffer of India, but the possibility of a direct route from East Africa to Australia with a stopping place on an island in the Indian Ocean, with a branch route to Singapore, brings the danger ever nearer. During the year a passenger from a yellow fever area in America managed to reach Singapore within the short incubation period of this disease. The Health Department cannot share any pride in such examples of rapid travel; they only give cause for anxiety.

FINAL COMPARATIVE FIGURES FOR 1949 AND 1950

	<i>Kallang</i>	<i>Tengah</i>	<i>Total</i>	<i>Kallang</i>	<i>Tengah</i>	<i>Total</i>
		1949			1950	
Total number of aircraft inspected	809	600	1,409	1,766	145	1,911
Total number of passengers and crew inspected ...	13,667	16,835	30,502	44,589	3,484	48,073
Total number of passengers put under surveillance ...	347	301	648	1,134	50	1,184
Total number of planes disinfected ...	—	—	—	—	—	—

(Figures for Tengah Airport 1950 are from January to March).

CHAPTER FOURTEEN

THE ISLANDS

THE attention paid to health problems on the islands around Singapore has continued throughout the year. The most notable advance was the commissioning of a new 53-foot motor launch for the furthering of medical attention to these outposts of Singapore. This launch is fitted up as a travelling dispensary and there is provision for setting up three stretchers in the cabin space and a derrick for lifting the stretchers from ship to shore. As this vessel works primarily amongst the island Malays it was named *Tengku Hussein* after that descendant of the ancient Royal House of Johore who assisted Sir Stamford Raffles in the founding of the Colony.

Beginning in 1951, this new floating dispensary will visit all the inhabited islands including Pulau Ubin and Pulau Tekong once every week and it will also transport the Infant Welfare staff on its visits. It will maintain a regular means of transport for the staff of the Rural Health Branch so that matters of malaria control and general sanitation can receive more attention than hitherto. Although the crew belong to the Master Attendant's Department it is most gratifying to see the way they enter into the work of the Medical Department and give willingly all kinds of extra assistance to the nurses and hospital assistants without which this work would be much more difficult.

The two groups of small islands lying off the South West Coast of Singapore belong to a world apart. Some are merely detached portions of the mainland; others are coral reefs covered with sand. In the outer group the most heavily populated are the coral banks; the larger islands have few inhabitants. The people are almost entirely Malay fishermen and their families, and being fishermen the nature of the approach to land is most important. One of the smallest Pulau Sudong is the most heavily populated, and here the beach can easily be approached from the sea at all states of the tide. The larger and hilly islands to the south, Pawi and Senang, are much more difficult to reach. They are also probably more malarious owing to the nature of the ground. At any rate Pawi is supposed to be haunted by ghosts which in the long run are said to kill off all who attempt to settle there. Unless the landing can be improved it is doubtful if an attempt to lay the 'ghost' would be profitable. Dangerous mosquitoes are obviously invading Pulau Sudong from somewhere, most probably from Pawi.

On Pulau Bukom Ketchil there are permanent anti-malarial works, and wells have been made in connection with the subsoil lines. This island is malaria free and has a reasonable water supply at all times of the year. There are some fishermen, but the larger numbers work on the neighbouring island of Bukom Besar. Here also are some Chinese squatters growing vegetables. The health of the population is good.

In addition to the actual islands there are several small villages on the western side of Singapore Island which are so cut off by mangrove swamps and distance from main roads as to be virtually islands. These villages, for example Kampong Ayer Bajau and Tanjong Murai, are now brought within the sphere of activity of the Health Department.

In the early part of the year new seepage areas caused by minor landslides appeared on the western side of Pulau Sekijang Pelepih adjacent to St. John's Quarantine Station. These were dealt with by subsoiling and stone packing. As the old subsoil lines were showing signs of becoming blocked advantage was taken of having a gang working on the island to re-lay all the old subsoil lines, with consequent improvement to the island water supply. There are now five subsoil wells functioning, two in the actual kampong area and three, including the best of all, situated around the coast and easily approachable in a small boat. As every family has a boat of some kind the situation of some of these wells is of no great disadvantage.

The second well constructed on Pulau Sudong has not proved a success. It is unfortunate that those in charge of the construction took advantage of an old well site situated in dried mangrove mud. There is still room on the sandbank where the first well was made for the construction of another well with more prospects of success and it is hoped to try again in 1951.

On Pulau Brani a Government Outdoor Dispensary had been conducted in a building belonging to the military since 1948. In the early part of 1950 this building had to be evacuated and for a time the dispensary was carried on for three mornings a week in the infant welfare building, which, unfortunately, was too small to accommodate a resident hospital assistant. The Straits Trading Company came to the rescue and put a building suitable for a permanent outdoor dispensary at the services of Government. The dispensary was reopened on a permanent basis during the latter part of the year.

In March considerable seepage was noticed at the hill foot behind Kampong Kopit on the southern side of Pulau Brani. This seepage area was subsoil-drained and at the outlet behind the village the water was led into a cement basin before it entered the final outlet to the sea. This cement basin, and the outlet above, now give an extra water supply to the village. At the same time the P.W.D. constructed a protected well some little distance away at Tanjong Teregeh. This village has now two new water supplies available.

Following a proposal to re-open the granite quarries on Pulau Ubin, a full mosquito survey of this island was made during the year. When the quarries were in full operation in the past, Pulau Ubin was considered to be malarious. At the present time no malaria is reported from this island. The survey indicated that *A. maculatus* and *A. sundiacus* were still present in numbers throughout the area in spite of the present absence of the disease. Any interference with the present land utilisation, or the influx of new population, should be preceded by anti-malarial works combined with an extension of our oiling programme.

During the year a consulting engineer visited Singapore to advise on water supplies and he very kindly went to the various islands and gave the Rural Board the benefit of his advice on the provision of better supplies to the isolated areas. In short, he advised an extension of our present method of supply. The greatest factor which has hindered extension so far is labour. As has been indicated before, the local inhabitants are mostly engaged in fishing, and it is probably too much to expect a man who has been out fishing all night to dig wells or to engage in other strenuous activities all day. Labour has to be brought from the mainland and labourers have to be given extra financial inducement to encourage them to abandon for a while the lights of Singapore for the outer darkness of primitive island life.

CHAPTER FIFTEEN

SCHOOL HEALTH

THE School Medical Service suffered very considerably during the year through changes in its staff. Only one officer who was in this sub-department at the end of 1949 was still available at the end of 1950. This is the one branch where reduction in staff will not hold up the machinery of Government so that urgent vacancies in other divisions have to be filled by taking officers from the Schools section. Whilst the effects of a depleted School Health Service are not immediately apparent, inadequacies in this respect will show in the coming generations of adults—the important factor.

Immediate staffing difficulty is not the only problem however. The Education Department is expanding very rapidly and the numbers of school children are increasing by leaps and bounds. Even the staff shown in the estimates will soon be insufficient to cope with the number of school children in need of examination and subsequent treatment. Certainly the number of nurses, hospital assistants, laboratory assistants and clerical assistants will have to be increased to meet the demand.

Apart from staff it is also necessary to have buildings in which to work. A well designed school medical and dental centre is a very urgent requirement in Singapore today and the sooner the Medical Plan is implemented in this respect the better. The idea is a centralised organisation to which children can be transported as required. This will save the time of highly paid personnel and limit the staff required to reasonable proportions. It is probable that as the Colony develops some smaller school clinics will be needed in other parts of the Island. In some of the more populous areas a combination of School Clinic, Dental Clinic, Infant Welfare Centre, and Outdoor Dispensary may well be required. At the moment medical clinics are held at North Canal Road, Paya Lebar and Telok Kurau and dental clinics at Tan Tock Seng Hospital.

There are at present 485 registered schools in Singapore. This figure includes afternoon schools held in the same premises as morning schools, and the Junior Technical (Trade) schools. The schools can be divided up as follows:—

			<i>Number</i>	<i>Boys</i>	<i>Girls</i>	<i>Total</i>
Government and Government						
aided Schools:						
English	...	...	35	13,616	8,216	21,832
Malay	...	...	43	5,714	2,722	8,436
Chinese	...	...	73	29,103	13,646	42,749
Indian	...	...	23	738	748	1,486
Junior Technical School	...	...	1	169	—	169
Government Afternoon Schools:						
English	...	...	13	3,274	319	3,593
Government Regional Schools:						
English	...	...	25	5,514	3,118	8,632
Private Schools:						
English	...	...	58	9,854	5,316	15,170
Chinese	...	...	214	22,670	7,532	30,202
Total	...	...	485	90,652	41,617	132,269

Almost all the Government and Government aided English schools and Malay vernacular schools were covered by examination during the year. The large number of Chinese aided schools cannot be examined yearly with the staff available, but an endeavour is made to have them covered every two to three years. As most of the Government schools except new entrants have been fully examined since 1947 only the first two primary classes and the two senior classes (those about to leave school) were included in the routine examination this year. Any child in the intermediate classes, however, who needed an overhaul was seen. The principals of these schools were most co-operative. The large majority of the children examined were found to be in reasonably good health.

Comparison of the figures for boys and girls shows that more than twice as many boys as girls are attending school. It may be that where places in school are limited the boy is given the advantage over his sister, or that a considerable number of people in Singapore still consider the education of their daughters to be unnecessary, a measure of the cultural stage of advancement of the population of the Island. It is noteworthy that in the case of twenty-three Indian schools which draw their pupils from the labouring classes, the education of girls appears to have the same importance as the education of boys—738 boys and 748 girls.

In 1950, 17,504 school children were medically examined in school (9,989 girls and 7,515 boys) as compared to 25,875 (10,486 girls and 15,389 boys) in 1949. There are two reasons for this apparent fall in numbers; one, the staffing difficulty referred to above, and secondly the fact that more children are attending the school clinics for treatment. This means that the school doctors have to spend more time on curative work with a consequent reduction in the time available for the examination of children in schools.

The new regional schools are bringing in a section of the child population which has hitherto received little or no state medical assistance, and there is a tendency for these children to show a much poorer state of general health than those dealt with in the past. This fact has a bearing on present and certainly on future comparative figures.

Medical findings amongst the children examined were as follows:—

Girls	...	...	...	74.69 per cent in good health
Boys	...	...	...	85.99 per cent in good health

Here again is some evidence of the better care given to boys at the expense of their sisters in Singapore homes. The reasonably good *total* health percentage seems to have been on the eighty level for the last three years.

Vaccination

4,979 school children were vaccinated, and out of this number 637 showed a primary reaction. Many of these children escaped vaccination during the Japanese Occupation and during the early post-war period.

Skin Condition

22.38 per cent of the girls and 11.74 per cent of the boys examined had some form of skin disease. Scabies is particularly prevalent amongst children from the Malay and South Indian populations. Hair lice were very prevalent amongst

Malay and South Indian girls. The practice amongst these people of keeping the hair of girls long, favours the harbouring of lice. It is significant that amongst some sections of these communities the absence of hair lice is considered to be a sign of ill health.

Scabies and head lice are a measure of the general conditions prevailing in the home. It is hopeless trying to control these conditions in schools whilst the children are exposed to constant re-infection in their own houses. To obtain lasting results it would be necessary to visit homes in all cases and treat the family as a whole. Fortunately modern methods of treatment make this a feasible proposition but attempts in this direction are only just beginning.

Worm Infestations

3,680 school children were treated for worm infection during the year. This is again a disease which is never ending unless the problem is attacked from the home. A child living in insanitary surroundings is exposed to constant re-infection and the elimination of worms by treatment becomes a temporary measure which needs frequent repetition. In some Malay schools many of the children do not wear shoes and so infection with hook-worm is encouraged. It is not that the children do not wish to wear shoes, or that their parents do not want them to do so. They just cannot afford to buy shoes at present prices in many instances.

Eyesight Defects

On the information available the eyesight of the school children of Singapore can be said to be generally good as only 2.91 per cent of the girls and 2.52 per cent of the boys examined had visual defects. Where the rough examination possible in the school or school clinic reveals a real defect of vision the child is referred to a qualified optician, and when the parents are unable to pay the Education Department gives financial assistance. Eye conditions requiring advice and treatment from an Ophthalmic Surgeon are referred to the Eye Department at the General Hospital. Such conditions are not very common however.

Anaemia

3.66 per cent of girls and 15.69 per cent of boys seen were found to have under 60 per cent hæmoglobin in their blood as indicated by the Talquist method of estimation. At first sight this difference is the reverse of what might be expected, but it must be remembered that girls tend to lead a more sheltered life than boys, and so are the less liable to worm infection. Also girls tend to leave school at the age of twelve and it is in the age groups above this where anaemia tends to be common in girls.

Bone and Joint Condition

Only twelve school children needed reference to the General Hospital for advice and treatment in this connection.

Neurodermatosis

Twenty cases of early leprous nerve infection were found in school children during the year. Such conditions are non-infectious in the usual sense of the term, and are treated as ordinary out-patients. Three Chinese boys and one Chinese girl were discovered to be suffering from frank leprosy and

the boys are now under treatment at the Hospital for Leprosy. The girl disappeared and it was subsequently discovered that she had been taken to Kuala Lumpur for treatment.

HEALTH IN ISLAND SCHOOLS

Kampong Pasir, Pulau Tekong Besar

This school is a new one opened during 1950. Eighteen girls and thirty-two boys out of a total enrolment of fifty-one were examined and returned a spleen rate of ten per cent. Nine children showed evidence of a minor degree of vitamin deficiency and five had a severe degree of anæmia (Hg. 40-50 per cent). In eleven the teeth were in a very bad state. Appropriate treatment was given in all cases.

Pulau Sudong

This school showed that out of thirty-three boys and ten girls from a total enrolment of forty-five examined fourteen had enlarged spleens, a spleen rate of 32.5 per cent. It would appear that the measures so far taken have suppressed clinical malaria but that the disease has not yet been eradicated. In general the children have improved in health over the last twelve months and skin conditions have been reduced very considerably. These children suffer from anæmia and it is thought that the condition is possibly associated with the comparative lack of vegetable food on this island.

INFECTIOUS DISEASES IN SCHOOLS

Chicken Pox

253 cases of chicken pox were investigated by the School Health Officers. The disease itself is not dangerous but it is very necessary to make certain that the case is not one of small-pox. If it were not for this danger chicken pox would attract very little attention.

Measles

Fifty-nine cases were investigated. The danger from this disease lies in its complications. Pneumonia is not such a frequent complication in children of school age here as in many other countries however.

Mumps

This is a troublesome disease from the scholastic point of view because of the long quarantine period of three weeks which interferes with education. It is necessary to limit the spread as far as possible by keeping the patients away from school until they have recovered. Mention of certain rare disablements which may follow from an attack of mumps generally results in local parents giving full co-operation although it is not legally an infectious disease.

Whooping Cough

Twenty-nine cases of this disease were dealt with. It is not an important condition in the school age child here and is rather a nuisance than a danger. General immunisation of young children was not practiced by the Government Health Department because there is doubt as to the lasting effect of the immunity conferred and because of the poliomyelitis present over recent years. Nevertheless whooping cough vaccine appears to offer assistance in limiting an

outbreak and seems to affect the course of the disease. A lymphocytosis in a child with a suspicious cough serves to indicate those cases which would probably benefit by inoculation.

Diphtheria

Twenty-eight cases were notified from amongst the children of school age, that is twenty-eight out of 132,565 or 0.2 per 1,000. This low incidence cannot be attributed to the success of any immunisation scheme, but seems to be rather a measure of a rather low incidence in this part of the world. While cases tend to be sporadic many are often severe which suggests that numbers of mild infections never come to the notice of medical practitioners. A proper scientific investigation of the prevalence of this disease and the value of the Schich test in this climate is called for before we can be definite as to how much diphtheria there really is in Singapore.

Typhoid Fever

In the early part of the year an outbreak of typhoid fever occurred in part of the crowded Chinese quarter of the town, and the schools in this area were affected. Infected ice cream sold by unlicensed hawkers appeared to have a bearing on the matter. Some 6,000 school children in the area concerned were inoculated.

Sporadic cases occurred in other schools for which no conclusive cause could be attributed. The total number of cases in children of school age was sixty-seven, and three of these died.

TUBERCULOSIS IN SCHOOLS

In dealing with tuberculosis in schools the method adopted so far has been to start from the known case coming from a school, either pupil or teacher, and to investigate all contacts by all possible means.

The reports which set the machinery of school investigation in motion come from the Schools Health Officers and nurses, from the Tan Tock Seng Almoner's staff and from health visitors. Mass X-raying of the school children and the teachers concerned is the rule, or class X-raying, or Jelly patch skin testing. Positive results are then investigated further. The Singapore Anti-Tuberculosis Association (S.A.T.A.) has rendered very valuable assistance in this X-raying technique and in reporting on the results.

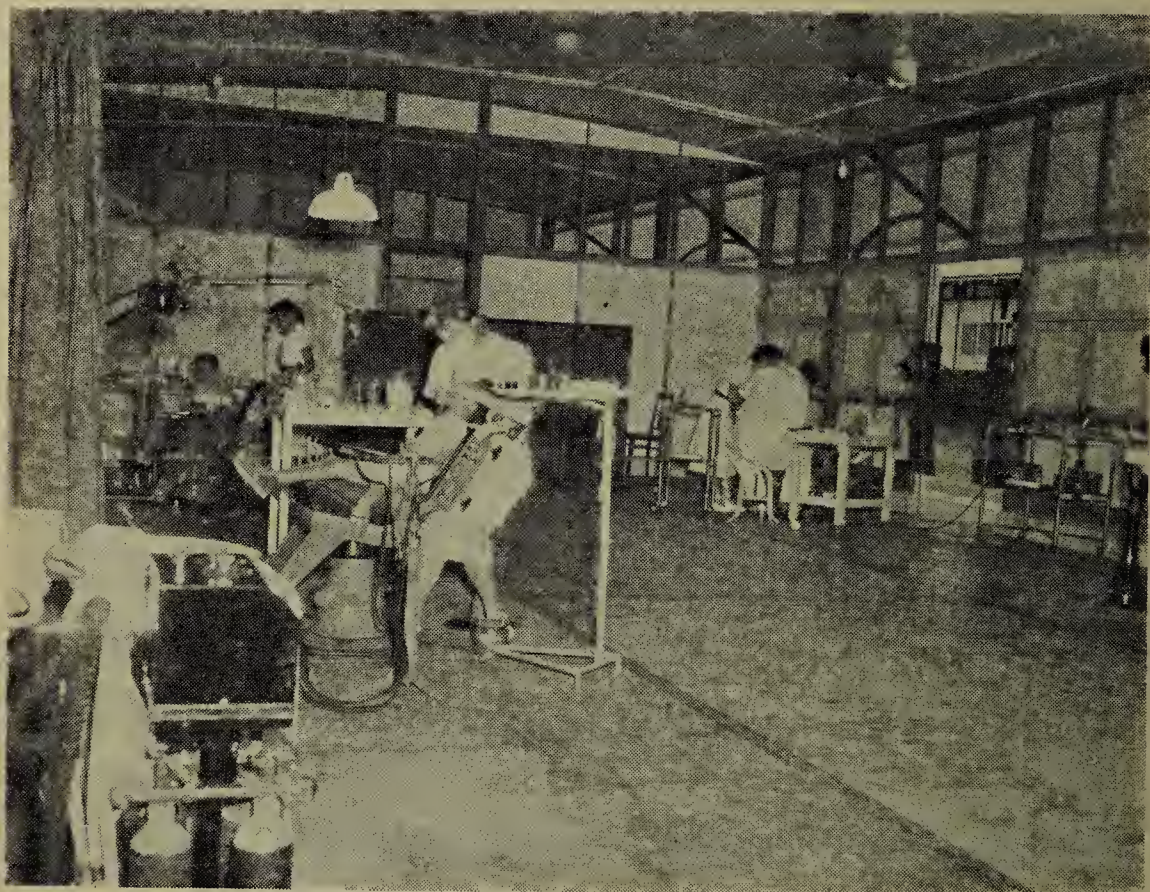
SCHOOL CHILDREN X-RAYED—BOYS AND GIRLS, 1950

		Numbers examined radio- logically	Numbers with Pulmonary Tuberculosis present radiologically	PRIMARY COMPLEX		RE-INFECTION		Post Primary
				Active	Healed	Active	Inactive	
Boys	..	4,290	363	163	158	38	4	..
Girls	..	1,529	169	29	124	11	5	..
Total	..	5,819	532	192	282	49 (0.84%)	9	..
1949..	..	3,174	281	100	17	51 (1.6%)	7	1
(1948..	..	596only)						



Public Relations

School T.B. Clinic



Public Relations

School Dental Clinic

SCHOOL TEACHERS X-RAYED

The survey on teachers started in 1949 was completed to the following extent :—

	Number examined radio- logically	Abnormal films	TOTAL ACTIVE CASES		Total arrested	Total still under ob- servation	Percen- tage active
			Sputum positive	Sputum negative			
Males ..	780	54	2	13	} 72	5	1.90
Females ..	883	94	4	20		4	2.7
Total ..	1,663	148	6	33	72	9	2.3

The results of X-ray in children and of their further investigation and assessment were as follows :—

Nothing abnormal detected	...	...	...	4,641
A. Active adult type Tuberculosis with positive sputum	...	...	...	10
B. Active adult type Tuberculosis with negative sputum	...	...	...	39
C. Inactive or arrested Tuberculosis	...	...	...	9
D. Active primary complex	...	...	...	192
E. Healed primary complex	...	...	...	282
F. { Tuberculosis of the Spine	...	...	...	2
{ Tuberculosis of the Knee	...	...	...	1
Bronchiectasis (not tuberculous)	...	...	...	4
Other findings (not tuberculous)	...	...	...	435
Pneumonitis (not tuberculous)	...	...	...	19
Under observation (not yet fully assessed)	...	...	...	182
Pleurisy	...	...	...	3
Total	...	...	...	5,819

A, B and F total fifty-two cases and comprise those which are tuberculous in the way understood by the ordinary layman.

C. (nine cases) are those who have had tuberculosis but in these cases the disease has healed. Whether this healing will go on to permanent cure depends largely on the stresses and strains to which these young people may be subjected to in their future life.

D. In an area where tuberculosis is a common disease children must sooner or later come in contact with its germs. This applies to most parts of the world. A few of these germs settle in the upper part on one or other lung and the surrounding tissues react to their presence. In the large majority of cases an immunity develops and the child is left with a lasting resistance to further small infections. This reaction of the tissues is beneficial and is called a primary complex. It is closely related to the immunising of persons against infectious diseases by vaccination or inoculation.

E. This figure relates to those children who have had a primary complex as in D and in whom the reaction has died away. It is, as it were, a vaccination scar which will gradually become less and less apparent.

Out of the fifty-one real tuberculosis cases twenty-nine were boys and nine were girls of sixteen years of age and over. This means that out of the children of school age (5-15) there were only thirteen cases of active tuberculosis. Three of these were in the age group 5-10 (two boys and one girl).

These 51 cases gave an active rate of 0.9 per cent if the unassessed are excluded as compared to 1.6 per cent from 3,174 children examined in 1949. 0.17 per cent had a positive sputum compared with 0.3 per cent in the 1949 survey.

TREATMENT

School children requiring actual treatment for tuberculosis are under the care of the Tuberculosis Specialist at Tan Tock Seng Hospital. Many are admitted, but in a few instances where circumstances and financial considerations permit the children are treated at home.

TUBERCULOSIS DOMICILIARY FEEDING SCHEME

The tuberculosis "feeding clinic" continued to be held at the North Canal Road School Clinic every Thursday morning. The purpose of this scheme is to give extra food to those children with an active primary complex who live in poor homes and whose parents cannot afford to give them the kind of food necessary to ensure that the child shall make a complete recovery, and not go on to becoming an actual case of tuberculosis. In the normal child the primary complex generally causes no apparent effect, but in the undernourished and overtaxed child a state of ill health may be observed during this period. Extra food and extra rest are essential in such cases.

The extra food provided weekly consisted of:—

- | | |
|--|----------------------------------|
| 10 eggs. | $\frac{1}{2}$ lb. dried milk. |
| $\frac{1}{2}$ lb. vitaminised margarine. | 1 cigarette tin full of peanuts. |
| 3 oranges and 4 apples (or local fruit in season). | |
| Vegetables, e.g. cabbage, or two large carrots or similar. | |

During the latter part of the year skimmed milk powder having become available free of charge from U.N.I.C.E.F., this milk food was substituted for dried whole milk powder, and to make it more palatable, the available money was used to buy Ovaltine to mix with it and so make it more acceptable to local taste.

There is a danger of such a scheme being used by poor parents to augment income at the expense of the child's health. All homes where children receive food are visited regularly by Health Visitors, and it is pleasing to be able to state that no case of selling of the food provided has been discovered so far. Another difficulty which is encountered in homes where there are other children, is that the food tends to be shared, so that the intended recipient does not get the full benefit. In consequence in homes where the primary complex is associated with a known case of tuberculosis all the children living there are taken on to the feeding list as a preventive measure.

Another difficulty is the securing of adequate rest for the child with a primary complex, and this is particularly difficult in the case of girls. The Chinese girl is expected to assist her mother and to look after her younger brothers and sisters. Unless she is too ill to be up and about a full day's work is expected from her. Also an overcrowded shophouse is not an ideal place for rest and fresh air. It is often preferable for children of this environment to continue to go to school as they can live a more restful life in this way than by remaining at home. The need for a true "Rest Home" for sick children in some country place beside the sea cannot be too greatly stressed. Here is the ideal opportunity for voluntary assistance on a large scale.

It is difficult to assess the benefits of such feeding schemes as this. The children are weighed at regular intervals but there is insufficient data available as to the normal weight-age curves of Asian children in normal health, and with adequate food. An increase in weight due to age may yet be below the normal increase to be expected over the same period of time. Physical examination and re-X-ray can show when the primary complex has healed. Extra food and rest constitute a very sound method of treatment with the bed shortages which must continue to exist. So this scheme will be continued. It allows for 100 children to be dealt with at any one time and 182 children were on the feeding list during the year. This means that 82 children were discharged from the scheme as free from danger and another 82 taken on during the year. Each child was given a full examination every third week and in all cases concurrent diseases such as worms, scabies, etc. were treated. Cod liver oil is given as an addition to the extra food in all cases. In 82 per cent of the children dealt with in this way the radiological findings showed healing of the lesion: 59 per cent gained in weight.

THE SCHOOL CLINICS

There are three school clinics in operation in Singapore. These treat children referred to the clinic as a result of school inspections, and children sent by headmasters and headmistresses for medical attention. For reasons beyond the control of the Department these clinics have to do far more work than a school clinic should and are in fact out-patient departments for children of school age. However, most of the cases seen would receive little, if any, attention if it were not for the out-patient function performed.

The main clinic is at North Canal Road. It is a small cramped building liable to be flooded when heavy rain coincides with a high tide. This clinic is open on Monday, Wednesday, Friday and Saturday in the mornings and on Monday and Friday afternoons. On Thursday mornings the tuberculosis feeding scheme operates from here. Paya Lebar Outdoor Dispensary is used as a school clinic on Monday and Friday afternoons. The clinic at Telok Kurau is held in a small room in the Telok Kurau School building. It is open on Tuesday afternoon. Serious cases seen at the two smaller clinics are referred to North Canal Road for complete examination and treatment.

School Health Officers are engaged on clinic duties for five mornings and five afternoons in each week. In addition the North Canal Road Clinic has a Sister and a Hospital Assistant on duty throughout each day except Saturday afternoons and Sundays.

NUMBER OF CASES SEEN AT CLINICS

			<i>New Cases</i>	<i>Re-visits</i>	<i>Total Attendance</i>
North Canal Road	...	...	6,667	11,935	18,602
Paya Lebar	...	...	1,131	1,936	3,067
Telok Kurau	...	...	1,380	708	2,088
			<hr/>	<hr/>	<hr/>
Total	...	...	9,178	14,579	23,757
			<hr/>	<hr/>	<hr/>

SANITARY REPORTS ON SCHOOL PREMISES

The building of eighteen new Government Regional Schools and seven non-Government Schools was completed in 1950. The Regional Schools consist of fourteen classrooms each, and are used for two sessions, morning and afternoon. Thus these schools actually serve the place of thirty-six schools. Eighteen dwelling houses were converted to use as small private schools. The Department dealt with twenty-three plans for new school buildings and forty-seven alterations and additions to school buildings.

Wherever possible new schools have water carriage sewage systems and during the year such a system was extended to the Victoria School, one of the largest in Singapore and one which has had to depend on buckets and commodes for years although standing adjacent to a municipal sewer.

The Sanitary Inspector attached to the schools division made 632 inspections of school premises (Chinese 391, English 135, Malay 54 and Indian 52). In the case of 10 unsatisfactory premises full reports were sent to the Education Department for action. In minor matters the principal of the school can often remedy the defect, and a direct approach is made in such cases.

SCHOOL TUCKSHOPS

A feature of the schools of Singapore is the number of hawkers who congregate round the gates of each during the intervals and when the children are leaving to return home. These hawkers sell various sweetmeats and drinks which, although they appeal to the taste of the children, have little to recommend them to the Health Officer in either their method of preparation, or in the manner in which they are exposed for sale. The situation is aggravated by the fact that many of the children leave home in the early morning without having eaten an adequate meal. By the interval they are really hungry and the hawker finds a ready sale for his goods. So persistent are these hawkers that in some places they even place themselves on the verandahs outside the classrooms and only the threat of force, with the power to implement it, can evict them from the school premises. Nevertheless these individuals are a menace to the child health of Singapore.

For a child to come to school in the morning without an adequate meal is most undesirable, the lowered vitality due to hunger favouring the spread of disease and seriously affecting the capacity of the child to benefit from the instruction received. So the provision of properly conducted school tuckshops where wholesome articles of food and drink can be provided during intervals is very important. These exist in some of the better run schools but even so the competition from the hawker without the gate must be ruinous. Proper drinking fountains should be provided wherever the presence of a pipe water supply permits.

SUPPLEMENTARY FEEDING FOR SCHOOL CHILDREN

Up to the present the greater part of any supplementary feeding for children of school age has been conducted by the Social Welfare Department at feeding centres. While these centres do not cater for the school child as such, they supply the needs of those children who ordinarily do not go to school, and, in addition to the provision of meals, simple education classes are also conducted.

In the United Kingdom the supply of milk to school children for the purpose of supplementary feeding is comparatively simple. The United Kingdom is a milk producing country and the milk is issued in bottles. It is a simple matter of handing out a full bottle and receiving back an empty one. From a practical point of view no milk is produced in Singapore and most of the fresh milk which is forthcoming could not be recommended as suitable for children. Milk is imported in tins, either condensed or powdered, and to serve a milkfeed the school is involved in a mixing process and the issue of the feed in cups, which later have to be washed. In addition Chinese and Malay children are not milk drinkers and as a rule they do not like it. Thus to ensure that the milk is taken it is necessary to add some sweetening or flavouring agent which adds to the expense.

It has been suggested to the Education Department that the large supplies of skimmed milk now available from U.N.I.C.E.F. could be utilised for the supplementary feeding of school children if this skimmed milk could be made up into palatable biscuits in a central kitchen and the biscuits distributed to the schools. Distribution to the children by the school masters would thus be facilitated and much handling and local preparation, with the added risk of contamination, would be avoided. Waste would be reduced to a minimum as the biscuits could be kept for some days in proper containers at the school. The provision of drinks which could be imbibed from the bottle in addition to the biscuits would provide the nucleus of a tuckshop, and if the biscuits could be made up in various flavours little more in the nature of extra food would be needed during the morning break.

It is possible that the provision of biscuits and sweet drinks would not be regarded with any great favour by the school dental service, but no doubt articles of diet equally favourable to dental caries would be consumed outside school hours in any case.

Dr. C. Coutts-Milne continued to be the senior school medical officer until she went on leave to the United Kingdom in March when her place was taken by Dr. S. Kiani.

SCHOOL DENTAL SERVICE

In the School Dental Service in 1950 there was a short break between the retirement of the second dental officer and the appointment of his successor, so that for part of the year there was only one officer maintaining the service. Much was achieved however. In the schools 3,552 children were examined; 3,321, or 93 per cent of these required attention and 2,753 of them were permitted by their parents to receive it. By the end of the year 1,768 of them had been rendered dentally fit.

Follow-up examination of children attended the previous year showed that little more was needed to maintain their dental health, one visit usually sufficing for this.

In addition to this work, some 2,115 children were referred by the school health officers for emergency attention, mainly extractions of temporary teeth. It is true that this is not conservative dentistry, but it has been repeatedly shown that the elimination of oral sepsis in this way is of great value to the health of the growing child. The total number of fillings for the year was 9,514. Extractions of temporary teeth numbered 4,170 and of permanent teeth 1,680.

During school holidays children from orphanages, Salvation Army Homes and the Leper Settlement were seen. It is always most satisfactory to attend to the inmates of such institutions as these where dietary and cleansing habits are carefully controlled.

During the year one of the wards at Tan Tock Seng Hospital was converted into a Dental Clinic for four dental officers with anæsthetic and recovery rooms and proved to be fairly suitable for this purpose, at least until the projected School Medical and Dental Clinic can be built.

The method of selecting cases for treatment which was begun last year, was continued in 1950, viz.:—Approximately 2,000 children at Government and Government-aided schools per officer are selected for full routine treatment and it is proposed eventually for these 2,000 per officer to receive full routine treatment and to be examined and treated every year. Due to the large amount of work required by the average child attending for the first time it was found impossible to treat all the selected children the first year. Consequently the children in the youngest classes received treatment first. This year and in subsequent years the new intake is treated in addition to the ones previously done last year, who will have moved up a class, and so gradually in this way the entire strength of these schools will be receiving full routine treatment.

Children other than those selected for full routine treatment and who are in need of urgent treatment receive treatment for the relief of pain. Such cases are referred by the school health officers during their visits at schools and one session a week is devoted to the treatment of these urgent cases.

It was noticed at the school inspections that the new intake of children in the primary classes required a large amount of treatment: on an average two hours was necessary to complete each case. Children in the middle classes who had received treatment last year required a small amount of treatment. Children in the senior classes attending for the first time exhibited gross dental neglect and required an average of three hours to complete each case.

CHAPTER SIXTEEN

THE NUTRITION COUNCIL

DURING the year the Nutrition Council held a number of meetings to discuss problems relating to the general health of the population, and members of the Council formed part of a sub-committee to the Select Committee appointed by the Government to investigate all aspects of the Child Feeding Scheme. The findings of this committee indicated that supplementary feeding was necessary in both urban and rural areas to improve the health of children in the poorer sections of the population. As the cost of the meal* distributed through the Social Welfare Department was high only a small percentage of the children in need of it could be supplied with this extra food. In consequence a recommendation was made suggesting a cheap 'snack' of skimmed milk cum vitamin cum cocoa drink with yeast biscuits and fruit. In this snack meal the vitamin contents of thiamin, riboflavin and vitamin C are at a higher level although there is a small reduction in the other dietary constituents. It was hoped that a much larger group of children could be "supplemented" by this means. The snack was modified in October by replacing the yeast biscuits with a special bun enriched with thiamin, riboflavin and iron. Some 2,417 children now receive this meal but the Council has stressed the desirability of extending the feeding scheme further to assist more malnourished children in both urban and rural areas, and in schools, leaving all the funds already voted to be used for the largest number of children possible.

The Council discussed the prevalent use of sweetened condensed milk as an infant food and the correlation between this method of feeding and the incidence of vitamin A deficiency in infants. After careful review of the data available at present it was considered that there was insufficient evidence to prove that vitamin A deficiency would result from the proper use of sweetened condensed milk. The enrichment of the foodstuff with synthetic vitamin A would not necessarily prevent deficiency owing to misuse of the product. Such a policy might actually be detrimental as the increased cost would add to the hardship of the poorest groups of the community.

Sweetened condensed milk is a bad infant food as there is an imbalance between carbohydrate, fat, and protein and the content of minerals and vitamins is lower than that of an equivalent caloric amount of dried full cream milk. The Council indicated the necessity of pointing out that the use of sweetened condensed milk for infant feeding should be discouraged, and recommended that infant welfare centres should maintain a programme of education of the public in the use of more suitable infant foods. The Council further suggested that Government should take legal action to prevent the advertising of sweetened condensed milk as an infant food. In order to increase the consumption of powdered milk it was recommended that importers should produce a pack to retail at approximately the same price as a tin of sweetened condensed milk.

The Council noted that it was very much concerned by all problems connected with the improvement of the nutritional status of the infants of Singapore and agreed to review the situation in due course when more evidence is available.

*Previous meal.

The Council considered the advisability of enrichment of specific foods as a means of adjusting the mineral and vitamin deficiencies of the traditional dietaries of the various racial groups in the Colony. In 1949 the Council had recommended to Government that enriched rice should be used in all Government and Social Welfare institutions and that the Labour Department should introduce its use into industrial canteens. Although the incidence of beri-beri is very low at present, dietary surveys indicate that many people exist on a borderline level of intake of thiamin. So the Council recommended that large scale enrichment of rice should be introduced into Singapore as a public health measure. It was stressed that such a policy would serve as a basis for protecting the public against any circumstances which would react unfavourably on the economic position of the poorer groups. Emergency planning on these lines was definitely proposed.

The Council discussed recent commercial projects for enrichment of wheat products and considered it desirable to protect the public by the establishment of standards of enrichment of such foodstuffs. Owing to the post-war trend of replacement of some of the rice used by other cereals in the Asiatic diet, the control of claims for enrichment of cereal products will become increasingly important.

The nutritional problems of the Colony of Singapore are similar to those of adjacent countries and close liaison between the Council and similar groups in these countries would be of mutual advantage. The Council therefore plans to establish and maintain such contact by distributing the minutes of the meetings to a group of people working in this field.

NUTRITION UNIT

The members of the Nutrition Unit, now a section of the Department of Social Medicine and Public Health, University of Malaya, work in close liaison with the Public Health Department, and while some of the work previously undertaken by the Unit continues, attention is drawn to the necessity of devoting more time to pure University activities and research. It will become increasingly important therefore for the Public Health Department to make plans for the maintenance of a small nutrition branch based on a proposed urban health centre where it can investigate adequately the patients and families referred from the out-patient departments of hospitals and from health clinics.

Professor J. H. Strahan on behalf of the Government of Singapore attended the second meeting of the Nutrition Committee for South-East Asia at Rangoon from 30th January to 4th February, 1950. This Committee discussed the effect of methods of preparation on the nutritive value of rice and reference was made to the work done in Malaya on the loss of vitamin B1 during the washing and the cooking of rice. The experimental trials of a premix (with added riboflavin) in Malaya and Singapore were reported and other methods of improving the nutritive value of rice diets were suggested especially by an increased consumption of pulses, fish and vegetables. Other topics for discussion included the feeding of particular groups of the population, such as industrial and plantation workers, and the development of feeding programmes for vulnerable groups. A general policy was formulated for nutrition education to be implemented by locally trained nutrition workers with the assistance of

teachers and health nurses. The Committee recommended that research in nutrition within the countries in the region be co-ordinated and inquiry be directed to the problems of tables of food composition requirements for calories and nutrients, and the dietary habits of various sections of the population.

Early in 1950 the Nutrition Unit took part in an investigation into the households of a group of Chinese farmers at the 10th mile Yeo Chu Kang Road. The study was conducted by the Department of Social Medicine and Public Health to obtain information regarding the medical, nutritional, social and economic pattern of this community. A clinical examination was made and records were obtained for heights, weights, percentage of hæmoglobin and the degree of helminthic infestation. Sixteen households were selected for close investigation and food consumption records were kept for these households for one month. During the following month, the households were kept under close observation to check that the recorded period represented an accurate assessment of the dietary habits of the families and to obtain further information regarding the economic status. The quantities of foodstuffs used in the household was expressed in terms of nutrients and the adequacy of the diet was then assessed. The findings of this survey indicate that this section of the population exists on a diet deficient in several essential nutrients. A detailed report of this work is being prepared for the Nutrition Council and later will be published.

The Unit is co-operating in a survey of school children to obtain data for heights and weights. These figures will be analyzed in relation to age and sex of the children, and the size and social position of the family.

The children of the Neelambikai Tamil School were investigated at the request of the Departments of Medicine and of Social Welfare. Dr. Danaraj conducted a medical examination and the Nutrition Unit surveyed some typical families in this area. There was clinical and dietary evidence of malnutrition and under-nutrition in these children and the Department of Social Medicine and Public Health recommended that supplementary feeding was required. Two months after the commencement of school meals the children were examined again and showed a marked improvement in health, and clinical deficiency signs had disappeared.

The Unit continued throughout 1950 to investigate families of patients admitted to the General Hospital suffering from malnutrition. Six families were referred to the Unit by the Almoner and seven families were studied at the request of Dr. A. D. Williamson. Other inquiries were made into the households of hospital patients to supply material for the teaching of the principles of social medicine to medical students. The members of the Nutrition Unit used these opportunities to give instruction to housewives in the selection of foodstuffs for the families and in food preparation and general hygiene. If the economic level was considered to be too low for the family to follow this advice the household was referred by the Unit to the Social Welfare Department through the hospital Almoner.

The Unit co-operated with Dr. Leong (Department of Biochemistry) in his study of losses of vitamin B1 during the preparation of rice to which premix had been added. The work was done in conjunction with the General Hospital Dietary Department and losses of vitamin B1 during washing and cooking were estimated. Experiments were done to determine the most conservative method of preparation.

As wheat products have a higher nutritive value than those made from rice, the Nutrition Unit is interested in ways of increasing the consumption of this cereal. In September the Unit was asked to conduct storage and palatability trials on a processed wheat product called rycena and to report on the suitability of this foodstuff as a substitute for rice in the Asian diet. The product was tested to determine the cooking time of unsoaked grains and of grains soaked for varying lengths of time, and then it was substituted for rice in fifteen different recipes used by Malays, Indians and Chinese. The main palatability trials were conducted in two Social Welfare institutions over a period of two months followed by short trials in two University hostels. Rycena prepared in the form of a sweet porridge is acceptable and dishes made from rycena flour were well received. However as a substitute for steamed, boiled or fried rice it is unpopular owing to the tough texture even after prolonged cooking. The colour and flavour were also considered less attractive than that of white rice. The storage trial is still proceeding but it is already evident that the processed wheat is subject to spoilage by insects in a similar way to the unprocessed grain. These results were reported to the Nutrition Council.

The Unit continues to record every fortnight the market prices of the common foodstuffs and therefore can assess the effect of fluctuations in price on the cost of living. The Unit has acted in an advisory capacity to Government departments on matters relating to diet and the supervisor of the Unit is a member of the Food Committee of the Social Welfare Department.

PART III

THE HOSPITALS DIVISION

CHAPTER SEVENTEEN

GENERAL REVIEW

THE original Medical Plan was published in 1947 and the following extracts in regard to hospitalisation from the report then issued by the Department are still relevant:—

Now that the debates on the budget for 1947 have been heard the citizens of Singapore are sufficiently aware of their financial future for the purpose of this memorandum. The present would seem to be an appropriate moment to review the medical needs of the community in consequence; the moment to decide on a broad outline of the sort of medical and health service which is to be aimed at for the Colony of Singapore. The decision must be an important one because it affects the future well being of every man, woman and child in this Colony. It rests on a brutal cash basis: it must be taken now: 1947 must be the planning year.

Is the Colony to have a small organisation dealing only with the minimum of its acute disease, or is an adequate hospital service on European lines to be evolved?

No medical adviser could subscribe to the former conclusion.

On the opening up of the hospital system during the months since the re-occupation the opportunity has been taken to re-organise and re-equip on a more modern system than the pre-war. Although the public cannot fail to realise by the time it has absorbed this brief review the unsatisfactory hospitalisation it must face over the next few years, it must be made aware of the fact that the re-organisation of Singapore hospitals was discussed for years before the enemy occupation, and that plans were in mind in 1941 for considerable improvement. Sir Richard Needham, during his visit to the College of Medicine on behalf of the General Medical Council in England, severely criticised the existing organisation in 1934 and again in 1939, particularly the lack of any proper out-patient system and the absence of 'units'.

A governmental committee laid down an interim plan for the General Hospital which was under action when the war broke out here and planning for an extended maternity hospital was also being done.

Thus it will be clear that an expensive and far-reaching hospital re-organisation was found to be necessary before the occupation; a complete overhaul is imperative now if even minimum needs are to be met. This is the ideal opportunity before large sums of money are wasted in attempting improvements which will satisfy no one. Without the scheme envisaged, inefficiency will grow with rapidity, and not only will the service given at present fall back with growing public clamour but the high standards which the public has a right to expect will become an impossibility.

The Singapore hospital system seems to have almost eliminated the poor during the Japanese occupation. The service seems to have become one primarily for the lower middle class. Whatever the pre-war practice this is still the position unfortunately. We have thus to accustom ourselves to dealing with the very poor on a proper scale. This means propaganda, and before propaganda, the necessary beds. As it is the medical staff is inundated with those who can pay something however small, and we cannot deal adequately with these. We are convinced that there is a really poor class in this city which has not been adequately tapped by our social services as yet, except in the field of venereal, of mental and infectious disease, and perhaps in infant welfare work. Such a section must be our future primary aim.

Nothing can really be done for chronic disease in this city today. All we can do is to try and treat what acute disease reaches us before it is too late, but even this has to be turned adrift at the first possible moment for the next case, third class patients to Tan Tock Seng up to a limit of 200 beds, and first and second class patients to their homes to convalesce. Such conditions as T.B. are not in the category of acute disease. Yet an attempt to deal with some 200 such patients is what we are doing and have done since the re-occupation. That these cannot be adequately treated should cause no surprise; this emotion should be reserved for the fact that even an attempt is made in this direction when every bed is required to keep the main stream of desperately sick at a really proper level. Rest and good food is given and as much medical care as circumstances permit, and this is all that can be expected for a long time to come in such cases. It is doubtful if even these cases of T.B. should be accepted under the conditions which exist in Singapore today.

The Leper Hospital has received more patients since the liberation than at any previous time in its history. Thus accommodation provided for some 200 pre-war cases has had to cope with nearly double that number. This congestion has been relieved by the transfer of some of the patients to Sungei Buloh. A policy as to future practice is under investigation.

Apart from one general urban dispensary and a travelling rural one under the control of dressers, only two crowded and very unsatisfactory general hospital out-patients departments are in touch with the adult population at the moment. In fact the existing out-patients service can be said to be totally inadequate in every way however strenuously the depleted medical and nursing staffs working in these sections strive.

Based on European and Dominion standards an approximate of 4,000 general hospital beds, excluding all special disease, is a low minimum requirement for such an area as Singapore. It means more than double the existing accommodation however but this is the figure which must be aimed at. It is one which should be sufficient to deal with all our acute disease. Even then we shall need extra hospitals to meet such activities as venereal disease, maternity cases on the present approach, T.B. and so on. I am taking it for granted that mental disease and leprosy will continue to be outside the scope of the ordinary hospital. We cannot possibly do with a smaller general hospital bed strength than this. The peoples of Singapore must face up to realities if they want their sick to be treated adequately. They must be prepared to pay for the minimum satisfactory service. All the drugs and equipment will soon be at hand. The thing to do now is to provide accommodation and staff. Both can and will be available if the proper approach is made. I have talked to local medical and nursing and midwifery graduates and these are not prepared to stay and work for the public unless the latter is prepared to give them what they think is a just and reasonable due. Not half the hospital beds required are available today.

In Singapore therefore the development of the proposed policy merely means an extension of an already existing base on an adequate modern structure; the provision of suitably equipped buildings, both old and new; suitable and sufficient staff to deal with these, a teaching institution both medical and nursing capable of the new demands. An advance to such a goal can only be obtained over a number of years. The staff problem alone makes this a necessity. Nonetheless real urgency exists. Full planning is required now, and a definite programme should be laid down and completed by the beginning of 1948. A five years scheme should be initiated on the following lines on the basis on an annual capital expenditure of some ten million dollars.

Since that report a further revision took place in 1948 with the adoption of a far reaching Ten Year Plan by the Legislative Council towards the end of that year. This Plan got under way to a small extent in 1950, and 1951 is to see the first really big advance towards the goal.

The years following 1946 have been years devoted to rehabilitation of the hospitals and planning for the future expansion made so necessary by the great increase in the population during and following the war years and by the extraordinary post-war demands, judged by pre-war standards, on all forms of modern hospital treatment.

To all intents and purposes the end of 1950 saw the completion of what could be done with the existing structures without the capital expenditure detailed in the Plan and outlined in Chapter One.

It also saw the erection of 52 semi-detached single roomed quarters under the first stage of the Plan in regard to the Leper Settlement, now known as Trafalgar Home, and the completion of the first stage of the Base Medical Stores. At Trafalgar Home these domiciles of simple and pleasing design are laid out in an attractive scheme, are lit by electricity and are comfortably furnished. Since each room accommodates two persons, 112 patients were able to move out of the crowded male wards. The relief of the congestion in the Settlement was unfortunately only temporary, however, as in a few months new admissions rendered the overcrowding almost as bad as before.

The new Base Medical Store is to be completed within the grounds of the General Hospital; the first stage consists of two large and one small store and a set of garages. Early next year it is hoped to complete this scheme with the building of a block of manufacturing laboratories and offices.

The lack of buildings detailed under the Plan for the existing hospitals proper has made conditions even more difficult for all departments as attendances have exceeded all previous yearly records. While it can be claimed that in general the present facilities compare favourably with those existing pre-war, it is realised that most departments are not adequately housed and equipped to cope adequately with the demands made upon them. More accommodation is now a very urgent necessity and until new buildings are available very little can be done to improve the present state of affairs.

Reference to figures of in-patients and out-patients will reveal the fact that the demands on the hospitals have been greater than ever before in every department and the extra work has called for more nurses, thus absorbing the very small gain in the total strength of nurses over the year. An all out drive for nurses cannot be initiated, however, until provision is made for nurses hostels. As it is, ward space and borrowed houses have had to be reserved for this purpose to keep the present recruiting scheme in operation.

During the year more new graduates from the Medical School were absorbed into the teaching hospitals to undergo their housemanship of one year, and they came as a very necessary and welcome relief. The medical staffing is in consequence more satisfactory in the junior ranks but the hospitals are still suffering seriously from the lack of medical officers of experience and of officers of specialist grades. The lack of living accommodation for the medical staff continues to be a serious problem.

The very limited progress made on the Medical Plan during 1950 was disappointing but the Estimates approved for 1951 give rise to the hope that there will be a substantial improvement in the position. During the year it was decided not to expand the present General and Women's Hospitals to the contemplated 1,500 and 588 beds respectively but merely to extend to a maximum of 850 beds at the former and 350 beds at the latter, developing instead a further scheme in another part of the town to house three blocks of a new institution housing general, children, and women's diseases and maternity sections to a total of some 800 beds.

It might be of interest to the lay reader to touch on some of the aspects of development in medical and health services that concern administration at this time which are of importance in the future prosecution of the Medical Plan for Singapore. The old adage 'prevention is better than cure' has been a guiding star to the medical profession for many years and particularly so in the twentieth century, and has led to the addition of many branches of the preventive side of medicine which will expand and multiply as the years go by. Antenatal clinics, post-natal clinics, child welfare centres, school medical and dental services, almoners and physiotherapists are all parts of this picture. These services have come to stay and their great importance is apparently realised by the citizens of Singapore if increasing attendances are any criterion. Many of them must be a part of the hospital system pure and simple. At Kandang Kerbau Hospital, for instance, antenatal clinics unknown in pre-war days have become of great importance and are attended by large and increasing numbers. Post-natal clinics, starting during the latter part of the year 1949 are unexpectedly congested.

Out-patient clinics of all kinds must play a very important part in the future development of the hospitals. It is now realised that large and adequate and well equipped out-patient departments with modern effective new medicines can enable the hospitals to treat large numbers of patients instead of admitting them into wards. So in hospital development the building of out-patient departments must have a high priority indeed. Only staff quarters can precede them.

Such divisions as almoners and physiotherapists and occupational therapists were considered to be the dream of a fanatic before the war. Today no hospital service can expect to function without such specialised organisations. That we have created such departments at long last is creditable but rapid expansion under the Medical Plan is an urgent necessity.

The medical services of all countries are now a very important part of the administration, and increasingly so with the widespread activities of the World Health Organisation since the recent war. Many representatives from World Health have visited the hospitals and health centres of Singapore during the year: Many medical officers, administrative and workers in the social field, in addition, have also inspected our activities. In May the Right Honourable James Griffiths, the Secretary of State for the Colonies, paid a visit to Malaya. On his first day in Singapore he made a complete tour of the General Hospital and visited all departments.

In September a Parliamentary Delegation from the United Kingdom visited this country. The delegation consisted of Mr. Popplewell, Mr. Lennox-Boyd and Mr. Niall MacPherson. These gentlemen visited the General, the Kandang Kerbau and the Tan Tock Seng Hospitals and showed great interest in their activities and problems.

NOTE ON NON-GOVERNMENT HOSPITALS

The following institutions provide beds for the public: —

Kwong Wai Siu Free Hospital (Chinese)	...	...	350 beds
St. Andrew's Mission Hospital (Children)	...	...	30 beds
Malayan Union Mission of Seventh-day Adventists	...	...	24 beds
Hainanese Hospital	...	...	20 beds
Kheh Hospital	...	...	30 beds

The first two of the above are run entirely for the poor and the Kwong Wai Siu caters for both Chinese and Western forms of medicine.

AVAILABLE BED STRENGTH OF VARIOUS GOVERNMENT HOSPITALS

Hospital	Pre-war	1946	1947	1948	1949	1950
General	750	550	550	600	700	700
Kandang Kerbau (excluding cots) ..	180	200	220	240	240	240
Tan Tock Seng	600	400	400	550	572	600
Orthopaedic .. .. .	..	60	60	60	65	70
Prisons	140	50	50	118	118	140
Social Hygiene (excluding cots) ..	Part of General	60	60	60	68	70
Infectious diseases	250	250	250	250	250	250
Leper Settlement	200	260	347	382	451	536
Police Training School	20	20	20	20	20	20
Mental	2,000	440	700	1,000	1,200	1,600

MAIN HOSPITALS OUT-PATIENTS ONLY

					New Cases	Total Attendances
1938	..	..	..	..	37,989	87,447
1947	..	..	..	..	85,120	258,917
1948	..	..	..	..	100,720	332,427
1949	..	..	..	..	105,118	380,599
1950	..	..	..	..	121,092	433,420

MAINTENANCE CHARGES OF THE MAIN HOSPITALS (DAILY AVERAGE)

				Paying Patients (a)	Paying Patients (b)	Free Patients
				\$ c.	\$ c.	\$ c.
GENERAL HOSPITAL						
Maintenance including diet	..	..		14 71	13 60	12 73
(Diet only	..	..	..	3 13	2 02	1 15)
KANDANG KERBAU HOSPITAL						
Maintenance including diet	..	..		10 72	9 97	8 31
TAN TOCK SENG HOSPITAL						
Maintenance including diet	..	..		..	..	7 18
SOCIAL HYGIENE HOSPITAL						
Maintenance including diet	..	..		..	..	6 49

YEARLY IN-PATIENT RETURNS

In-patients				Paying	Free	Total
General	..	..	..	2,708	15,901	18,609
Kandang Kerbau	..	..	..	3,854	13,029	16,883
Tan Tock Seng	..	..	..	..	2,055	2,055
Social Hygiene	..	..	..	..	2,617	2,617
Middleton Hospital	..	..	..	..	1,795	1,795
Orthopædic	..	..	..	..	109	109
Total				6,562	35,506	42,068

Excluding mental and leprosy cases, out of a total number of 42,068 cases treated in Singapore's hospitals 35,506 or 85 per cent were free. All leprosy cases are treated free of charge also. In regard to mental disease over 90 per cent at any one time are free cases.

CHAPTER EIGHTEEN

THE GENERAL HOSPITAL

THE General Hospital is at present the only acute hospital, excluding gynæcology, for medical and surgical cases in the Colony. It now comprises many units whose individual activities are recorded in this section. Its basic bed strength remained at 650 since the lack of sufficient nursing staff prevented the opening up of extra wards, although 50 to 100 further beds were available if required. Such additions meant serious overcrowding however. When the new building under the Medical Plan is carried out and additional nursing staff is recruited the General Hospital will be able to provide a total basic bed strength of 850.

This hospital is used as the main teaching institution for medical and dental students and is the training school for nurses.

During the year much further new equipment was acquired and this added greatly to the efficiency of the units in the investigation and treatment of patients. When the contemplated extension has been completed many special divisions such as radiology and dermatology will be better distributed and organised. These have to be run on a more or less day to day basis at present.

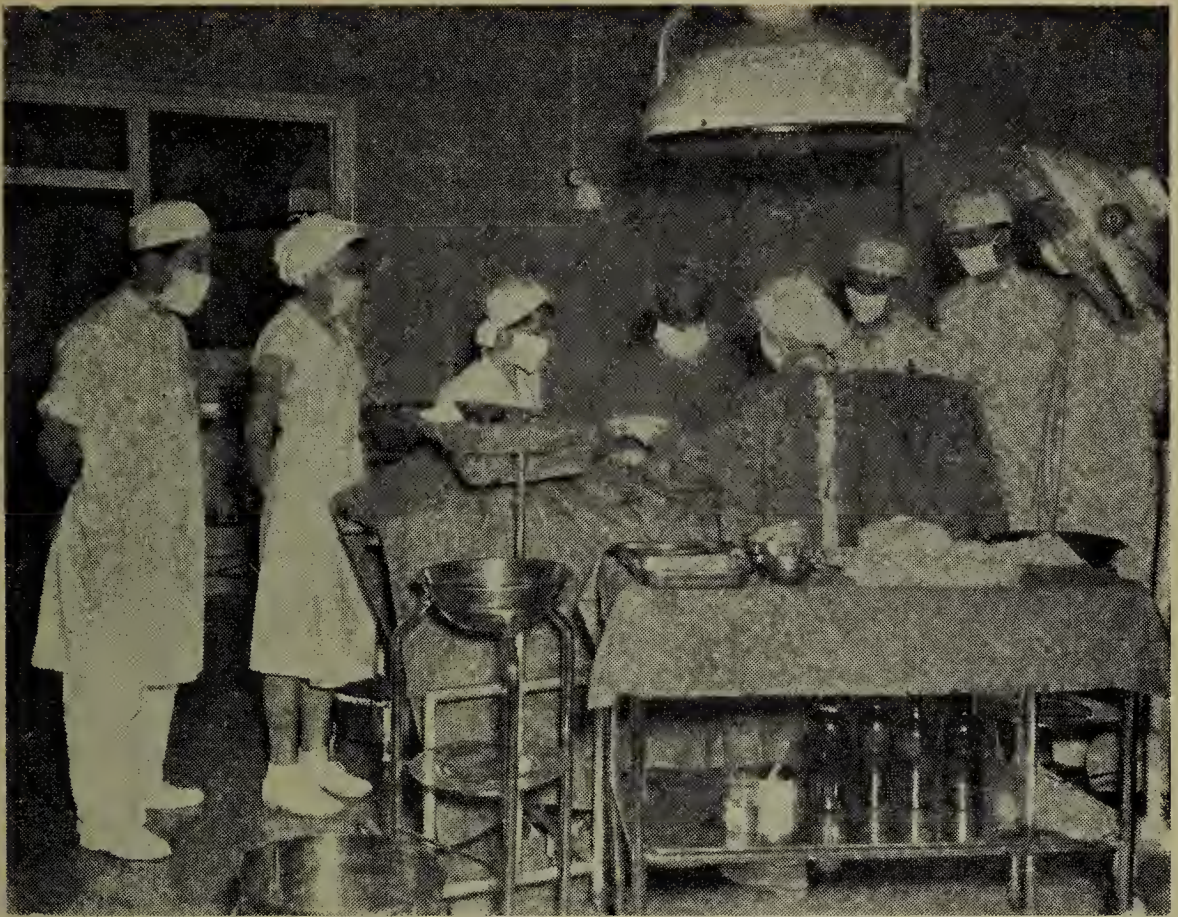
The training school for nurses acquired a new epidiascope and extra models and diagrams for teaching and it is hoped to purchase a sound film unit early next year. The value of the latter was apparent by the interest and enthusiasm shown by the nurses in the education nursing films made available by the kindness of the United States Information Service and the British Council. Each of these organisations proved invaluable in this and other directions during the year.

1950 saw the resources of the hospital taxed to the uttermost in dealing with out-patients and in-patients and both showed an increase over any previous year. The following tables are of interest in this respect:—

Out-patients				New Cases	Repetitions	Total Attendances
1947	..	..	..	40,496	73,671	114,167
1949	..	..	..	45,966	107,568	153,534
1950	..	..	..	53,811	108,713	162,524

In addition the Medical Officer-in-Charge of Officials dealt with special cases as follows:—

—				1949	1950
Examination of candidates for Government service				2,544	3,361
Inoculations and vaccinations	..	..		855	970
Medical Boards	..	..	..	108	85
Total ..				3,507	4,416



Public Relations

Operation in progress



Public Relations

Nurses Training School

In-patients				Daily average	Male	Female	Total	Death %
1949	..	..	..	607.5	11,357	4,700	16,051	12.5
1950	..	..	..	642.46	13,080	5,529	18,609	12.75

The marked increase in the daily average number of patients, reveals the serious overcrowding of wards that was a feature of the year and a constant strain on the staff when it is remembered that the duration of stay in hospital was again reduced to a minimum. In December unusual demands on the hospital were occasioned by the riots in Singapore.

Nationalities		NEW CASES				REPETITIONS			
		Male	Female	Child	Total	Male	Female	Child	Total
Europeans	..	1,178	526	285	1,989	1,860	1,887	747	4,494
Eurasians	..	512	271	172	955	867	724	370	1,961
Chinese	..	16,010	9,361	8,662	34,033	37,817	17,490	14,373	69,680
Indians	..	7,151	1,856	1,913	10,920	15,110	3,947	3,296	22,353
Malays	..	2,820	718	708	4,246	4,854	1,358	1,375	7,587
Javanese	..	386	155	118	659	361	215	231	807
Others	..	396	307	306	1,009	429	849	553	1,831
Total	..	28,453	13,194	12,164	53,811	61,298	26,470	20,945	108,713

	<i>New Cases</i>	<i>Repeats</i>	<i>Total Attendances</i>
	53,811	108,713	162,524
Daily Average	..	147.43	297.84

THE MEDICAL UNITS

There are three separate medical units providing accommodation for 224 patients, one of these being for the care of sick children. Accommodation in all three units is seriously overtaxed, particularly in regard to children and it is this latter section which must receive priority in the planning of the medical units in the opinion of the administration. The new children's block of 200 beds under the Medical Plan has become an imperative need in Singapore today. In the meantime the sub-division of two wards in the General Hospital by glass partitioning is urgent in view of the change in the plans which has taken place by limiting the hospital to some 850 beds.

Teaching facilities have been considerably extended to both medical and dental students during the year. While more beds are required for medical cases requiring hospitalisation there is no doubt that a modern, up to date out-patient organisation would have a very considerable effect in this direction.

All medical wards are chronically overcrowded with emergency beds filling the verandahs and middle areas of the wards, rendering work very difficult and trying for both medical and nursing staff particularly during the emergency 'take in' periods. The large increase in the number of medical students has resulted in increased difficulty in teaching, not only in the medical wards but in all the other units of the hospital. The performance of the ordinary routine work of the hospital coupled with a heavy teaching programme for students have laid an onerous burden on the staff and particularly on the nursing staff of the hospital.

Two special clinics functioned during the year, one for cardiac cases amongst school children referred by the School Health Officers and one for patients suffering from eosinophilic lung.

During the latter part of the year two medical officers from the Department of Social Medicine were attached to the medical wards to investigate the socio-economic background of selected cases.

On the therapeutic side all the newer drugs, especially penicillin and the sulpha drugs, continued to be used on an ever increasing scale with highly satisfactory results. This necessitated a very considerable increase in the drug votes in the 1950 Estimates as compared to any previous year.

A new clinical laboratory has just been completed and much new teaching and diagnostic equipment has been installed. Research work has continued but is confined to the clinical study of selected diseases. While there were no special features regarding the incidence of adult disease the following research was in progress under the direction of the Professor of Clinical Medicine (Professor Monteiro):

The Incidence, Pathology and Social Pathology of Rheumatic Heart Disease in Singapore—It is generally believed not only in temperate climates but also in Singapore that rheumatic heart disease is non-existent or excessively rare in the tropics. The aim of the investigation is to show that it is one of the major causes of heart disease in Singapore. Work is still in progress and material is being collected but a preliminary note on this subject has been published in the current issue of the Proceedings of the Alumni Association.

Liver biopsy—As a means of diagnosis and prognosis in liver disease is being specially carried out by Dr. Khoo Oon Teik. The scope of this work is not yet determined but it will be a valuable aid and guide to the diagnosis and management of liver disease.

Typhoid Fever Investigations—The treatment of typhoid fever with Chloromycetin is still in progress. Up to date 47 cases, with 6 deaths, have been treated. It is proposed to collect 100 cases before publication. Chloromycetin is a valuable chemotherapeutic agent in typhoid fever. With the dosage and length of treatment adopted in this investigation the temperature comes down in three days and the patient remains well without any complications being noted. Convalescence is hastened.

Aminopterin in Acute Leukæmia—By arrangement with Messrs. Lederle, a stock of this powerful drug has been obtained for the treatment of acute Leukæmia. This Folic Acid antagonist is one of the latest in the fields of chemotherapeutic agents in neoplastic disease, and the results obtained are interesting. Urethane, Nitrogen Mustard and Deep X-ray therapy are also being used in Leukæmia and the results obtained are compared with the results obtained with Aminopterin treatment. Four acute cases were kept alive for four months and of four chronic cases three are alive and well.

Pentamethonium and Hexamethonium Bromide—Stocks of these have been obtained from Messrs. May and Baker (London) through Dr. Forgan, and cases of high blood pressure and gastric and duodenal ulcers are being treated. Research is in progress. So far 15 benign and 2 malignant cases suffering from hyperplasia have responded well to treatment and 6 peptic ulcers have shown a complete relief of symptoms.

Artane in Parkinsonism—This is being investigated.

Anæmias in Singapore—This is a new investigation which is being planned for Dr. Wong Hin Sun, and preliminary steps to this effect have been completed.

PUBLICATIONS (PROFESSOR MONTEIRO)

What is Social Medicine?, Impressions of a Post-graduate Student in the United Kingdom, The Care and Management of Heart Disease in Pregnancy, Preliminary Note on Rheumatic Heart Disease in Singapore, Exophthalmos, Anuria as an Emergency in Clinical Practice.

Dr. Haridas writes as follows:—

The clinical investigations carried out on Eosinophilic Lung since 1946 were completed, and this work submitted in the form of a thesis for the Doctorate in Medicine, was accepted by the University of Malaya. This study has led to the recognition of a large number of cases in Singapore so that one morning in a week has been set aside for the treatment of these patients. The results are gratifying in that cures have been obtained in all cases with but few relapses. The total number of cases seen so far has been 380.

Leptospirosis—A number of cases of fever of short duration, formerly undiagnosed, have been proved to be mild anicteric cases of leptospirosis.

Atrial septal defect—This congenital cardiac defect is being increasingly recognised.

Publications

Danaraj, T. J.: *Eosinophilic Lung—A Study of 150 cases seen in Singapore.*

Cheah Seng Kee and Shanmugaratnam, K.: *Bronchogenic Carcinoma with Cutaneous Secondaries.* Proceedings of Alumni Association, King Edward VII College of Medicine, 1950, III, 224.

Danaraj, T. J.: *Leptospirosis—A Clinical Study of nineteen cases including seven with Meningitis, and a Note on Treatment with Penicillin.* Proceedings of Alumni Association, King Edward VII College of Medicine, 1950, III, 38.

While 40 beds are allocated to the nursing of children up to 70 were accommodated on occasions and admissions during the year totalled 2,922 compared with 2,098 in 1949. There was a reduction in the total mortality from 41.3 per cent in 1949 to 35.9 per cent in 1950. If deaths occurring within 24 hours of admission are excluded the mortality is reduced to 21.3 and 18.6 respectively. This points to earlier admission in cases of grave illness and is an encouraging sign. The principal diseases in order of frequency were gastro-enteritis, broncho-pneumonia, naso-pharyngitis, bronchitis, tuberculosis, and helminthiasis in that order. The principal causes of death were gastro-enteritis, broncho-pneumonia and tuberculosis (all forms). Acute gastro-enteritis and broncho-pneumonia are still the most important since nearly half the admissions are due to these conditions in infants under two.

There is a definite and interesting decrease in the incidence of tetanus neonatorum (thirty-six cases). Dr. Low Siew Gek in a paper in the *Medical Journal of Malaya* reports that the incidence in hospital practice has dropped to one-third over the past four years and that this reduction can be taken as a reflection of the improvement in the maternal and child welfare services.

A three months survey of the treatment of acute broncho-pneumonia with aureomycin as against penicillin and sulpha drugs showed the following reduction in mortality:—

Penicillin and Sulpha drugs	... mortality 50 per cent.
Aureomycin	... mortality 30 per cent.

Of 213 cases of tuberculosis in children dealt with one-half were of the meningeal form and this led to most of the deaths as so far anti-biotics here proved very disappointing in this connection. 38 miliary tuberculous cases recorded 33 deaths.

TEACHING OF MEDICINE—PRACTICAL AND THEORETICAL

During the year 112 students attended the Medical Clinic in the Department of Clinical Medicine. This included 50 students in the fourth year, 34 in the fifth year, and 28 in the sixth year. Classes were held right through the year as students were posted for duty even during the vacation. The students have each to clerk 24 cases which are personally investigated and after they have been read to the Professor, a summary is prepared by the student and kept as a record for his own use. Case readings are done every Monday morning. On Tuesdays, infectious diseases classes are held at the Middleton Hospital. On Wednesdays a clinico-pathological class is held where symptoms and signs are correlated with post-mortem specimens demonstrated. On Thursdays and Saturdays, teaching ward rounds are conducted. On Fridays, students attend out-patient and usually a neurological case is chosen for special demonstration on this day. On Saturday there is a cardiac clinic to which all students are invited. Lectures on difficult clinical subjects are given on Mondays. Systematic lectures in medicine right through the academic year are given on Wednesday afternoons, and on Friday mornings.

A 'follow-up' out-patient department has been established and this functions twice each week.

Unit Chiefs:—

Professor G. A. Ransome, F.R.C.P.

Professor E. S. Monteiro, F.R.F.P. &S., M.R.C.P., D.C.H.

Dr. Gopal Haridas (children), J.P., M.R.C.P.

THE SURGICAL UNITS

The three surgical units again covered a considerable volume of work during the year, the number of operations totalling 9,997 as compared with 6,828 in 1949, an increase of some 46 per cent. Two-fifths of all operations performed can be classed as 'major'. Thus major operative procedure is now a daily routine, affording considerable opportunity to those students mindful of this. The scheme for house surgeons noted elsewhere has proved a success and the housemen who walk the wards cannot but benefit from the great amount of acute material at their disposal. Much practical assistance and advice through consultation was afforded by the R.A.M.C. as in previous years.

The surgery performed represents a vast amount of work and indeed over-work on the part of the surgical staff available and the increase indicated over any previous year was carried through with a reduced staff on occasion and with

no appreciable improvement in accommodation. It represents, of course, only a part of the work as out-patients seen are as considerable in this field as in others. The small physiotherapy and almoner's divisions now in operation helped to relieve the pressure on the wards, but far, far more of this form of assistance is required. It will not be available on a sufficient scale until the new out-patient department envisaged is in being. The increasing surgical work of the hospital alone is sufficient indication for the necessity of the Medical Plan. A considerable expansion on a more modern basis is a real necessity if Singapore's Medical Services are to meet the demand for the latest forms of surgery, the present trend.

OPERATIONS PERFORMED

1948	1949	1950
5,070	6,828	9,997

Mr. B. M. Johns, O.B.E., M.B., CH.B. (N.Z.), F.R.C.S. (Edin.), D.T.M. & H., was in charge of a combined general surgical and Ear, Nose and Throat unit. He rightly points out that the time has long since passed when E.N.T. work for a Colony with a population of a million can be considered a 'side line'. A separate unit for this speciality is a matter of urgency. The administration is only too well aware of the defects occasioned by lack of sufficient accommodation and staff. These defects have been summarised in previous annual reports and measures to remedy them are the basis for the accepted Medical Plan.

In his report for 1950, the Professor of Surgery, Mr. J. K. Monro, M.D., M.CH. (Cantab.), F.R.C.S. (Eng.), M.R.C.P. (Lond.), writes as follows:—

During the three terms systematic lectures have been given in the Faculty of Medicine to 84 students. Lecture-demonstrations on operative surgery have been given in the Post-mortem Room of the General Hospital by the Professor of Clinical Surgery. The Sister-Tutor in the General Hospital gave two courses of lectures. In August, 57 students attended; in January, 23. These large numbers prevented the valuable demonstrations in which students should be made to take part with their own hands.

Clinical opportunity in the units is available the year round without interruption. Responsibility under supervision, essential in the training of all medical students, has been less satisfactory than ever before because there are up to 30 students on a unit.

The following posts remained vacant throughout the year—one post of Lecturer and Chief Assistant and two posts of Surgical Tutor. Dr. Khong Ban Tze was the only permanent Assistant. The Government scheme provided seven House Surgeons, each for part of the year. The laboratory of Ward 6 has now been equipped to undertake most of the investigations of the unit. The Laboratory Assistant also helps students in such examinations. He has mounted in plastic museum jars a number of operation specimens for teaching purposes. Adjoining this laboratory space has been partitioned off to make a small lecture room to seat a dozen students.

No out-patient department has been provided to remedy the defect criticised by the General Medical Council's Inspector in 1934. Out-patient facilities were pronounced 'conspicuously inadequate' by the Carr-Saunders Commission in 1947. Each unit is therefore snowed under, on its 'take-in' day, by cases that would be dealt with in the casualty or out-patient department of most hospitals. The senior medical staff is less. Recently new graduates have been more, and students since the war vastly more.

Government's 'scheme for House Surgeons and House Physicians' is a success, and will be more so when a Residents' Mess is built, standing orders for Resident Staff published, and traditions created. Some of the housemen do not understand that the knowledge of medicine and surgery this gives them, the opportunity of acquiring habits of methodical examination of patients and writing notes, of taking part in conducting the work of a great hospital, of talking shop with doctors similarly engaged, should fit them for the work of a general practitioner or general duties officer. It is not designed to train them as specialists. For this purpose there exist in the units posts of Tutor and posts of Chief Assistant. The 'Goodenough' year as houseman becomes compulsory in Britain in 1951, and Malaya must follow suit if General Medical Council recognition is to be retained. Allowance must be made for this added number in planning the Residents' Hostel. The starting of an Almoner's Department has caused

patients to take fuller advantage of the hospital facilities. Introduction of uniform hospital stationery of quarto size and a stenographer to file notes and deal with correspondence has improved records. All these things are observed by the student that conscientiously walks the wards, and are reflected in his work.

Research and publication have been rendered difficult by the shortage of experienced medical staff. During this year a follow-through session once a week has been introduced and a start made on hernias and new growths. The classification of every case admitted to the wards of the unit has been made according to the International Statistical Classification (1949) of the World Health Organisation.

Mr. D. E. C. Mekie, M.B., CH.B., F.R.C.S.E., F.I.C.S., Professor of Clinical Surgery writes as follows:—

During the past year I have to report again alterations in staff. Mr. Yeoh Bok Choon has returned from study leave and has resumed his duties as the Senior Tutor. Mr. Cohen has continued to work with me. There has been the usual succession of House Surgeons.

I should like to place on record my appreciation of the work of my two Tutors, for they have undertaken duties of a most onerous and exacting character without grumbling and without hesitancy. Surgery is now the work not of an individual but of a team, and these members have shown themselves willing to enter into the spirit of the team of this unit.

Again, as on previous occasions, one must consider the statistics as indicative of the work done, and below we have the figures showing the total number of admissions, the total number of operations, and the total number of major surgical procedures performed:—

<i>Months</i>				<i>Total</i>	<i>Operations</i>	
				<i>Admissions</i>	<i>Major</i>	<i>Total</i>
January	...	...	...	242	69	260
February	...	...	...	210	59	230
March	...	...	...	216	81	307
April	...	...	...	231	105	311
May	...	...	...	243	104	321
June	...	...	...	241	105	280
July	...	...	...	207	81	254
August	...	...	...	217	87	227
September	...	...	..	248	58	289
October	...	...	...	219	50	246
November	...	...	...	237	75	386
December	...	...	...	346	108	456
Total ...				2,857	982	3,567

The steady upward trend is apparent, and as I noted in my last report, not only is there an increase in the quantity of the work done, but there is a steady change in the quality of the work done. We continue to do more and more heavy operative work which is so characteristic of the present day.

During the past year we have been engaged in a certain amount of what may well be described as research work. Operative intervention for the relief of pain in cases of lympho-epithelioma with cranial metastases has been continued and a report of this work has been published in the *British Journal of Surgery*. It is not with any intention of reporting one's own work that note is drawn to this: it is mentioned in order that the endeavour to undertake research work in the unit of the General Hospital may be appreciated by those who administer it. Another example of this work which has been carried out is the treatment of cases of œsophageal stricture occasioned in most instances by the swallowing of caustic soda. We have succeeded in evolving a new operative procedure which has in certain cases given most satisfactory results. Patients who hitherto have been unable to eat have now been returned to their families well and capable of eating in a normal way. This is an advance which has been reported in the *Medical Journal of Malaya*, and it has represented a real advance in surgical technique.

Once again we have to thank Brigadier Marsden for the work which he did in this unit. During the past two and a half years, his help has been of immense importance to us, firstly by reason of the load which he took from our own staff, and secondly by the stimulating help he gave us as a consultant and as a teacher in the unit. He has returned to the United Kingdom and an expression of gratitude has been earned from us. It is most fortunate that his successor, Brigadier Clyne, has also been good enough to offer to help us and has already undertaken operative work in the unit.

ANÆSTHESIA

Dr. D. A. B. Hopkin having left the service during the year, Dr. Edward Morrison, B.A., M.B., B.CH., B.A.O. (T.C.D.), D.A.R.C.P. & S.I., writes as follows:—

During the past year the use of the toxic liposoluble anæsthetic substances, viz. Chloroform, Di Ethyl Ether, Di Vinyl Ether, Ethyl Chloride and Trichlor Ethylene have been almost completely abandoned, as also the practice of subarachnoid nerve block.

The routine anæsthetic for abdominal section has been an induction with Thiobarbitone with the exhibition of 2–5 ccm of 'Eulyssin' for the purpose of muscular relaxation; intratracheal intubation was carried out either trans-nasally or trans-orally with a cuffed Magill Intertracheal Catheter, and continuance of anæsthesia with Cyclopropane and Oxygen.

In all cases in which this routine has been practised there has been no fatality attributable to anæsthesia; there has been almost complete absence of post-anæsthetic vomiting and of pulmonary complications.

Short procedures are usually carried out under intravenous Thiobarbitone. Quite a number of intrathoracic operations have been performed with endo-bronchial tamponage, Crauford Magill Technique. One successful pneumonectomy was dealt with in this way, the anæsthetic used being the same as for abdominal section except that Nitrous Oxide has been preferred to Cyclopropane where diathermy is used.

Much attention has been paid to the Broncho-Tracheal Tollet, which the writer considers to have been of great use in preventing pulmonary complications, for in a humid climate such as Singapore many patients tend to have considerable mucus secretion in the bronchi and trachea, which is sucked out before the patient is returned to the ward.

Most patients have been given a post-operative dose of Nikethamide (5 ccm) in addition, which tends to cause them to clear their upper respiratory tract and to bring them quickly back to consciousness, when pain is controlled with Pethidine 50–100 m.g.m.s. This makes the ward work much lighter as these patients do not require the close watching which ether-soaked, vomiting, semi-conscious patients formerly required.

It has been noted that Eulyssin produces an absence of surgical shock, the exact explanation of which the writer does not understand but which he will take up with the Professor of Physiology.

It has been observed that Pethedrine is an unsuitable analgesic for intrauterine and obstetrical cases, as tending to post partum hæmorrhage or bleeding. No doubt this is because of its trophine-like action.

During the past year, although he has no exact figures, the writer has gained the impression that there have been as many or more anæsthetics administered in Kandang Kerbau Hospital as in the two surgical units at the General Hospital, amongst which were several successful Wertheims.

The writer would like to add an appreciation of the services of the Blood Transfusion Service, which has been invaluable and which has certainly saved many lives. The officers of this service have been efficient as well as most obliging and co-operative.

OPHTHALMOLOGY

The work of the division of ophthalmology has continued to expand with an increase in the number of new cases and operations.

Keratomalacia continues as before; its occurrence was considered by the Nutrition Council during the year and is referred to in the appropriate section of this report. A virus disease, epidemic kerato-conjunctivitis, has been prominent during the period under review resulting in some untreated corneal opacities which show little sign of absorption. Trachoma although still widespread in mild and cicatricial form continues to become less prominent as a condition requiring active treatment.

The division has co-operated with the Blind Advisory Committee and arrangements are being made to provide more specialised care for the blind, particularly in the teaching of braille and handicrafts, but of the 500 known blind persons in Singapore only a small proportion are considered to be suitable for further

education. While a survey of blind persons is now being arranged by the Almoner, the impression is that the proportion of blind to population is low as compared with other Eastern cities.

The new out-patient division with a main operating theatre completed in 1949 has been a boon. The entire accommodation forms a single unit on one floor and is probably the most modern and best equipped Ophthalmic Department in existence in the Far East. Much new up-to-date equipment has been installed.

The pressure of more important work has made it necessary to limit the amount of pure refraction work undertaken, but when more staff becomes available proper clinics for school children will become a feature.

RETURNS OF OPERATIONS FOR THE YEAR

Cataract Operations	...	...	...	...	282
Broad Iridectomy	...	...	...	...	19
Optical Iridectomy	...	...	...	...	20
Iridotomy	...	...	...	...	5
Excision of Prolapse Iris	...	...	...	...	11
Excision of Prolapse Iris with purse string suture	...	...	...	...	12
Preliminary Iridectomy	...	...	...	...	1
Paracentesis	...	...	...	...	20
Diathermy for detachment of Retina	...	...	...	...	7
Cyclodialysis	...	...	...	...	27
Recession	...	...	...	...	5
Trainor's Operation	...	...	...	...	2
Toti's Operation	...	...	...	...	10
Excisions of Lach. Sac.	...	...	...	...	3
Mucous Membrane Graft	...	...	...	...	41
Skin Graft	...	...	...	...	5
Enucleation	...	...	...	...	49
Evisceration	...	...	...	...	9
Mc. Reynold's Operation	...	...	...	...	110
Foreign Body (Extraction)	...	...	...	...	59
Extraction of Foreign Body by application of magnet	...	...	...	...	3
Tarsorrhaphy	...	...	...	...	14
Chalazion	...	...	...	...	64
Expression of Trachoma	...	...	...	...	132
Epilation of Eye Lashes (Diathermy)	...	...	...	...	262
Diathermy of Prolapse Iris	...	...	...	...	18
Diathermy for vessels and Corneal Ulcers	...	...	...	...	33
Application of Tonometer	...	...	...	...	49
Exenteration	...	...	...	...	1
Arruga's Operation	...	...	...	...	7
Various	...	...	...	...	159
Total					1,439

The number of operations undertaken is an increase over any previous year. (1,170 in 1949 and 707 in 1948).

Head of Unit: Mr. A. D. Williamson, M.B., CH.B. (Glas.), D.O.M.S., F.R.C.S. (Edin.)

DERMATOLOGY

Dermatological conditions are very prevalent in Singapore and although total attendances at the out-patient department of the Skin Clinic numbered 7,776 this does not give any indication of the numbers who would have been seen had the activities in this direction been fully extended. This work received far more individual attention than previously however.

Leprosy—119 new suspected cases were seen at the General Hospital of which 40 proved to be positive and 79 negative. The follow-up clinic dealt with 2,633 visits. Non-infectious cases are treated as out-patients with one weekly injection of sulphone or hydnocarpus oil. Diagnosis is made on clinical grounds. Infectious cases are admitted to Trafalgar Home.

Dermatitis—This constitutes the largest group. Most patients are Chinese with dermatitis due to previous self-applied medication. Some cases are very severe and require instant admission and skilled nursing, which means allocating them to different wards as at present there is no specific in-patient section devoted to dermatology as such.

Scabies—A clinic for treatment has been instituted and is proving popular. Students attend all clinics at regular and appropriate intervals.

Note:—The lack of sufficient facilities in this connection particularly stresses the necessity for an up-to-date out-patient organisation.

Head of Unit—Major K. Greenwood, M.B., M.R.C.P. (by arrangement with the Director of Medical Services, F.A.R.E.L.F., to whom thanks are due for this further instance of active co-operation).

RETURN OF SKIN CASES

	NEW CASES				REPETITION			
	Male	Female	Child	Total	Male	Female	Child	Total
NATIONALITY								
Chinese ..	703	643	378	1,724	2,140	1,821	523	4,484
Indians ..	237	69	34	340	516	118	59	693
Malays ..	115	26	40	181	120	39	18	177
Eurasians ..	11	7	1	19	11	28	2	41
Others ..	18	16	20	54	38	14	11	63
Total ..	1,084	761	473	2,318	2,825	2,020	613	5,458
DISEASES								
Mycoses ..	62	18	6	86	53	24	8	85
Impetigo ..	14	25	62	101	13	38	52	103
Prurigo ..	6	10	17	33	25	54	73	152
Psoriasis ..	16	11	2	29	50	42	8	100
Dermatitis ..	184	136	48	368	237	167	48	452
Eczema ..	116	82	49	247	159	110	48	317
Scabies ..	80	37	79	196	Scabies Clinic			531
Cheirpopoholyx ..	39	22	4	65	60	21	3	84
Lupus Eryth ..	10	11	13	34	47	38	3	88
Lupus Vulgaris ..	2	3	1	6	6	10	2	18
Yaws ..	2	2	5	9	5	6	14	25
Acne ..	15	6	2	23	17	2	1	20
Syphilis ..	3	2	1	6	2	1	..	3
Leprosy ..	73	35	11	119	Leprosy Clinic			2,633
Others ..	462	361	173	996	310	316	221	847
Total ..	1,084	761	473	2,318	..	..	..	5,458

Grand Total = 7,776.

THE DENTAL CLINIC

The following comments are taken from the Professor of Dental Surgery's Report (Dr. R. J. S. Tickle):—

The Dental Clinic at the General Hospital forms part of the teaching section of the Dental Department of the Faculty of Medicine, University of Malaya. In consequence this report should be read in conjunction with the annual report of the University.

The staff position remained much the same as in the year 1949, and there seems little chance of filling vacancies until after future final examinations.

There has been a considerable increase in the number of patients admitted for treatment during the year 1950, a 28 per cent increase over the 1949 total.

The number of extractions has increased for both adults and children, as has the total number of dentures constructed. This is a most undesirable trend since our efforts must be directed towards conservation. The disappointing decline in conservative surgery is due to the fact that the majority of students had not reached a sufficiently high standard of work in their fourth year to permit of a normal programme. Students must complete all work, irrespective of the nature, on any patient assigned to them, and this has resulted in fewer patients per student.

The Police Dental Clinic is now functioning in a separate building and additions have been made to the Dental School Clinic at Tan Tock Seng Hospital where three dental surgeries are available now.

—				Chinese	Indians	Malays	Others	Total
Adults	..	..	..	2,542	700	605	197	4,044
Children	..	..	..	1,543	164	67	52	1,826
Total ..				4,085	864	672	249	5,870

Total attendances and average daily attendances compared with previous years are as follows:—

Year				Number of Patients	Total Attendances	Daily Average
1947	..	..	..	3,973	22,932	57
1948	..	..	..	3,895	29,355	70
1949	..	..	..	4,599	38,806	94
1950	..	..	..	5,870	36,868	85

DIETETICS

This is the first attempt at an annual review on the dietetic position at the General Hospital since Dr. Lucius Nicholls, C.M.G., the Nutritional Adviser to the Special Commissioner to South-East Asia, drew up the present food scales at the request of the Director of Medical Services in 1946, and it is submitted by the first dietitian (Miss E. Christie) appointed to the Medical Department of Singapore. She writes as follows:—

Food has naturally been of vital importance and interest to man since the beginning of time but it can be said only to have received serious scientific attention from the beginning of the twentieth century with the discovery of the nature of vitamins which initiated and stimulated widespread investigation and research by chemists into the chemical composition of foodstuffs and the relationship between food deficiencies and ill health.

From newspapers, periodicals, books, lectures and radios the general public has learned a great many facts about the importance of food in the maintenance of health both in infancy and adult life and shows a great interest in the comparatively new science of dietetics. The problems involved in the feeding of acutely ill people have long been appreciated, and the knowledge gained on the illnesses caused by food deficiencies has served to emphasise the necessity for a fully trained dietitian in all hospitals to assist physicians and surgeons in their work of fighting disease and ill health.

In the tropics where so much deficiency illness exists the dietitian finds the problems confronting her even more complex than in temperate countries, and in Malaya, where so many different nationalities live, further complexities arise with the various racial and religious customs in the composition of diets and their cooking. In the General Hospital for instance there are various nationalities and religions represented in the cooks provided (Chinese, Sikh, Bengali, Indian, Muslim) and these cook in separate kitchens and have separate types of food to prepare.

All kitchens are equipped with gas ovens, and large kua-lies in which rice is cooked by steam are additional to one section.

On commencing her duties at the General Hospital the dietitian had several initial tasks to perform, namely:—

- (a) to assess the position of the present feeding scheme;
- (b) to make such improvements and additions as were possible with the present facilities;
- (c) to initiate plans for development and improvement now and for the future.

Kitchens and Staff—As the rebuilding or remodelling of the kitchens is part of the Medical Plan, no large-scale changes have been made.

Number served—daily average:—

Paying Patients: (a) general diets	...	...	29 daily
Paying Patients: (b) general diets	..	...	67 daily
Special diets (a) and (b)	...	...	18 daily
Children—all classes—free	...	...	59 daily
Other free patients	...	...	433 daily
Special diets—free patients	...	...	78 daily
Total			684

The present facilities are simple, the main deficiencies being more modern kitchen equipment to facilitate the speed of preparation of food, and means of serving food hot and freshly cooked. Extra equipment has been ordered with this in mind.

Free Patients' Food

Daily Average Diets

Chinese	...	...	...	323
Malay	...	...	...	34
Indian	...	...	...	63
Bengali	..	...	...	13
Special	...	...	...	78
Total				511

These kitchens need improvement both in building and equipment. The food supplied to patients is plainly cooked and palatable. Higher grade cooks and better facilities would improve the appeal of food served. By enquiry from the patients themselves and from the nursing staff it seems that most of the patients are satisfied. The changes in their diet that have been made are (1) an increase in the amount of vegetable allowance daily from 4 to 6 ounces, purchase weight (plus allowance for wastage in certain vegetables) thus providing 2 ounces of cooked vegetable per head twice daily; (2) an increase in vitaminised margarine from 1/6 ounce per patient to 1/2 ounce per patient per day to improve the vitamin A and D content of the diet.

The crucial difficulty at present is in the transport of food in a satisfactory manner. Trolleys or containers capable of keeping the food sufficiently hot on the journey to the wards are lacking. Most food goes in open containers on open trolleys, some of the journeys taking a considerable time owing to the widely separated wards. In the wards, the very limited space of a household stove and the time necessary for serving meals to a large ward plus the variety of dishes for different nationalities make it difficult to serve food hot. Electrically heated trolleys from which food can be served directly to patients are on order and this should make a considerable difference to the attractiveness and nutritive value of the food served. The Director of Medical Services gave this problem his particular attention during his visit to the United Kingdom in 1950.

The obvious essentials in catering for patients are:—

- (a) to supply food of good quality;
- (b) proper preparation and cooking of this food;
- (c) the provision of nutritionally adequate food to patients in a form in which they will eat it.

The question of food provision is inextricably concerned with finance, and it has been necessary to start a system of food costing to determine how the money is being spent on the various articles of food, and to ensure that the money is being used to the best advantage.

The standard diets have been analysed and have been found to be adequate and of good quality though leaving some room for improvement in making the meals more attractive to patients. The main differences that have been made are in variety. There is a more frequent change of menus than previously and new dishes have been introduced. Many Asian patients prefer local foods so a special menu for them has been instituted. Apart from ensuring the adequacy of a diet as regards quantity and quality one must consider the likes and dislikes of patients and provide food that appeals to them so that it will be eaten.

The preparation and cooking of food have been improved but there is a great need for more widely experienced cooks to produce the desired results. Particular attention has been paid to the checking of raw food as regards the quality and there appears to be room for improvement in this connection.

The use of fortified rice has been continued as it considerably improves the nutritive value by supplying additional Vitamin B and is satisfactorily taken by patients. It is difficult to measure the diet served by a pure nutritional standard as that widely accepted and recommended by the National Research Council (U.S.A.) is not completely applicable in this country. This problem has been discussed with the Nutrition Unit of the University of Malaya and much help has been given by this unit in finding out the dietary habits of the people of Singapore.

As so many patients are not in a very good state of nutrition when they are admitted, larger amounts of certain foods, particularly meat and vegetable, might be considered desirable and this question will receive further investigation. However any really malnourished patients or tuberculous cases have daily extra eggs, liver and milk, so that the most needy cases have their diet supplemented.

From visits to wards to see what patients actually eat, and from what is left on their plates, it seems that most of them eat their meals well and some have second helpings. Regarding the type of food—there are so many national and individual ways of cooking and flavouring in patients' own homes and their meals include so many 'side' dishes that hospital food does not appeal as much as home cooked meals. On assessing the diets on accepted nutrition standards, it would appear that the patients require still more protective foods.

The present feeding scale for free patients is (weights given are raw food as purchased):—

Fish	...	...	...	...	4 oz.
Meat or	...	...	...	...	4 oz.
Eggs (2 oz. approx.)	...	...	...	...	1 duck egg.
Rice	...	...	...	...	8 oz.
Vegetable	...	...	...	...	6 oz.
Fruit	...	...	...	...	one serving about $\frac{1}{2}$ oz.
Margarine	...	...	...	...	$\frac{1}{2}$ oz.
Bread	...	...	...	...	4 oz. or more.
Jam	...	...	...	...	about $\frac{1}{3}$ to $\frac{1}{2}$ oz.
Sugar	...	...	...	...	about $1\frac{1}{2}$ to 2 oz.
Seasonings	...	...	...	...	according to nationality.

The free patients' meal routine consists of:—

- Morning: Tea with milk and sugar; 2 ounces bread with margarine and jam.
- Tiffin (11 a.m.): Fish with rice and vegetable; Fresh fruit one serving.
- Dinner (4 p.m.): Meat or omelette, with rice and vegetable.
- Supper (7 p.m.): Cocoa or ovaltine with milk; 2 ounces bread with margarine and jam.

Special diets:—

Paying (a) and (b)	...	...	...	...	18
Free	...	...	...	...	78

Average per day

Attention has been paid to making special diets effective by keeping contact with patients and with medical and nursing staff to see that:—

(a) food sent from the kitchen is taken by the patients;

(b) that the whole diet regime of these patients is scheduled and carried out.

It has been possible to make special diets individualised to some extent by making ward visits, but the large number involved renders such visits only practicable to those patients who particularly require individual diet therapy. An attempt has been made to instruct patients leaving hospital on special diets and as the medical and nursing staff become more aware of the services of a dietitian more patients are referred to the Department. Twenty-nine in-patient diabetics have been instructed on the particular diet required as well as many cases of gastric ulcer and nephritis.

Out-patient Diets—Out-patients who require instruction are referred to the dietitian and in cases of poverty such patients have been sent to the Almoner who has arranged necessary financial aid so that they may continue diet treatment at home.

One of the present needs is for the establishment of a diet clinic to provide a regular centre at which patients can attend and where a proper follow-up can be initiated. This will need an expansion in the dietetics division.

Lectures to Nurses—A short course of lectures on elementary nutrition and diet therapy has been delivered to student nurses. This instruction is very important not only in teaching necessary nutrition and the importance of good feeding but also in increasing co-operation in making diet therapy effective in the wards.

Advice on Food—At the request of the Tan Tock Seng Food Committee advice has been given on several occasions on the food supplied to the tuberculous patients in Tan Tock Seng Hospital.

Number of Dietitians—Owing to the size of this hospital and the number of in-patients and out-patients, more trained dietitians are necessary to cope with this important work. Although vacancies exist for dietitians there has been difficulty in obtaining competent recruits. It now seems that the only possible solution is to train suitable local graduates locally and then send them abroad for further training. A dietitian's training in the United Kingdom occupies some three years to complete a Science degree at a University with special subjects, followed by one year at a hospital which has a training course for dietitians. At the satisfactory completion of this course a certificate or diploma in dietetics is issued. Possibly the University may be able to institute a suitable course to this end in due course. A lecturer in nutrition has recently been appointed and this should help considerably in the arrangement of a suitable course. The year's special training in dietetics could possibly be established at this hospital.

The dietetics division is merely in a stage of development in Singapore and until further qualified staff is available it will be impossible to expand sufficiently the work of this very important speciality. As it plays such a vital and essential part in the treatment of the sick it must be extended to all our hospitals however.

THE ALMONER

The Almoner (Miss K. J. Eastaugh) comments as follows:—

The 1949 report on the Almoners division outlined the basis of the work undertaken for the individual patients, the co-operation which was essential with the voluntary and statutory organisations dealing with various aspects of the patients' lives, and an indication of the more generalised welfare schemes which were put into operation within the hospital itself.

The Almoner's work in the prevention and cure of disease has been closely allied to the problem of obtaining general security for the patient in his personal life and also in the field of employment. The difficulties which arise from admission or attendance in the hospital are very apparent to the Almoner in her personal approach to her patients and the study of each one against his own individual background has been the essence of the Almoner's work. In the General Hospital it was necessary to consider carefully whether large numbers should be interviewed and some attempt made to help them all, or whether only referred cases from all the units should be dealt with in the most thorough manner. It was decided that only intensive work on each patient would be satisfactory because medico-social work which does not aim at the cause of the problem and does not rehabilitate the family to be self-supporting is an unprofitable service to the patient and to the community.

After-care Need

The main contact with in-patients was made during their treatment in the wards and when they were referred to the Almoner on discharge from the hospital. The variety of the diseases with the different degrees of residual disability prevented any

quick solution to the problems presented but has rather stressed the need for many specialised forms of after-care which are not at present available in the community. The greatest needs are for residential care for all age groups of patients suffering from various forms of paralysis, home nursing for patients who cannot be admitted to hospital, and for those who require daily injections or dressings. The Almoner has worked in very close co-operation with Government departments and voluntary associations who are endeavouring to open residential homes. Much time has been spent in planning a home visiting service for disabled children. This scheme is in its early stages and will be more comprehensive in the New Year but valuable experience has been gained by this work and the Almoner and the British Red Cross Society, Singapore Branch, are now investigating the possibility of extending the service for all children and to cover home visits to help the adults who need elementary nursing in their own homes.

In the last report it was stated that discussions would take place in the Department of Labour on the rehabilitation and training of disabled patients. A great deal of work has been accomplished towards reaching this objective and a detailed plan has been decided upon to make the replacement of disabled people in industry possible.

Nearly all the free patients sent to the Almoner were from the wards, those patients who live on daily incomes, live in overcrowded cubicles and either have large numbers of dependant children or no relatives or friends to care for them. A diagnosis always raises implications with regard to people other than the patient, with the family and employer usually involved. So the Almoner has had to associate herself with all the dependants from the time of the first interview.

During the year the division registered 800 new patients. Help was given in raising money for emergencies, for the chronic sick who can no longer return to work, for supplying extra nourishment to those men, women and children suffering from malnutrition, and for additions to the diet recommended by the hospital dietitian for those patients suffering from such diseases as diabetes, nephritis, and gastric trouble. Many homes were visited to obtain a first hand opinion of the living conditions of the patients, and where possible improvements were made.

James Craig Fund

The Almoner was fortunate in having from 20th June, 1950, \$300 per month placed at her disposal which is the interest of an endowment called the James Craig Fund. This fund has done more to alleviate the acute misery of patients and their dependants than it is possible to describe and the personal gratitude shewn by patients is out of all proportion to the individual cash grants made. The fund has been used to augment very low incomes, to pay for journeys to hospital so that treatment could continue, to give small comforts to those whose expectation of life was limited to a few months, for educational books for the children studying in the wards, and to pay the rent where patients who had been unemployed or sick for long periods were threatened with eviction. This fund unfortunately is limited to those patients and their dependants who have received in-patient treatment and cannot be used to help the hundreds of people who attend only at the out-patient department.

It is possible to list the basic services of the division such as the supply of artificial appliances, the transport arrangements made for patients, the contacts made with industry and commerce to secure employment and training, and the help given to those requiring residential care or legal advice. Behind all these services which in an annual report must be generalised it is as well to re-state the direction of the work based on the individual with his own problems. Many hours were spent in giving advice on a personal level and there have been many difficulties in dealing with relatives who do not appreciate the capacity the human being has for adapting himself to changed circumstances and permanent disablements thus making new plans difficult to execute. An illustration of this is the case of a mother with an incurably blind baby under three weeks old who said that she would buy the child artificial eyes and it would not need residential nursery care or blind training at a later date. This lack of realisation that the baby was blind necessitates careful follow-up so that at the time when the child needs the appropriate training it can be arranged.

Each form of sickness has required special arrangements for after-care treatment and during this early stage of development it has been essential to keep methods adaptable, to keep in touch with every unit within the hospital to find out where the demands are greatest so that development can be on constructive lines and plans for the future care of the patients can be made.

Special Class for Disabled Children

The special class for disabled children in the McNair Road School is performing an excellent work and seventeen children under the direction of the Education Department are attending. Some children have now been transferred to ordinary schools because their physical condition improved, but the number has been maintained. Great

credit is reflected on the transport section of the Social Welfare Department which has given full co-operation in taking the children to and from school. This class could expand however with additional transport, and it is hoped that within the next few months extra cars will be available for this work.

It is probable that early in 1951 classes for deaf and dumb children and also for blind children will begin either under a voluntary society or under a Government department.

Student Almoner Training Course

One important development during the year was the beginning of a training course for student Almoners. The fundamental plan is based on the training given in the United Kingdom and the one given in Australia. A woman graduate who gained a Bachelor of Arts Degree in the University of Malaya was selected as the first student Almoner and her training, which will take fifteen months, began in October 1950. The course combines theoretical and practical work and will end in December 1951. The theoretical work consists of the study of social medicine under the direction of the Professor of Social Medicine and Public Health, University of Malaya, and administrative law and psychology taught by specialist graduates in the respective subjects. Anatomy and physiology, hygiene and nutrition is included.

The practical work includes visits of observation to all the statutory and voluntary social agencies, to all the bodies concerned with public administration and the structure of the community. Training will also be carried out in the Almoner's Department, both in the General Hospital and Tan Tock Seng Hospital where routine office administration, interviewing of patients in the wards, the study of the social significance and background of illness and the principle of medico-social work will be concentrated. The implication of the different diseases and their effects on the individual, the family, and the community living both in rural and urbanised areas will also be studied.

The theoretical work in the training scheme has been specially adapted to add to the subjects which are not read in the B.A. degree but are required by medico-social workers. When the University plans are developed to include a Degree in Social Science it will not be necessary to include in the course psychology and administrative law. The training has been planned therefore to give the first student the maximum training required by the highest standards in the profession and her training will not be different in any way from those students who follow on at a later date when the Social Science training given in Singapore is more fully developed.

The work of prevention of disease was carried on mainly through the contacts made with the relatives and friends of patients by making it financially possible for them to come for early treatment and by helping them to maintain the standard of living as far as possible when the total family income would have dropped below the level necessary for the maintenance of health. It was possible in many cases to anticipate specific diseases in families by the comments of patients who were worried and to ask them to bring their relatives for medical examination.

Other Hospitals

Many patients have been helped in both the Trafalgar Home and the St. Andrew's Orthopaedic Hospital. The problems from both hospitals were those which apply to all long-term patients and they required detailed case-work. With long-term patients it is essential to have consistent personal contact with them, and the work has been limited by lack of staff. When the vacancies which now exist for each hospital are filled in the new year the medico-social work will be available to all those who require help while undergoing treatment.

The Almoner's division was started only in 1949 following an investigation by a visiting senior Almoner from St. Thomas' Hospital, London, in 1948. Thus here again we have a new departure in Singapore which is an essential and vital part of the hospital services in the United Kingdom. As a large hospital in that country has an Almoner's team running into double figures, it is clear that our minute organisation in this respect has carried out a very important form of work under very difficult conditions and one which must be steadily expanded. Patients must be studied as individuals today apart from the actual diseases encountered, and they must be helped and advised outside the actual wards and clinics if the good work done there is not to be wasted.

CHAPTER NINETEEN

TUBERCULOSIS

(TAN TOCK SENG AND CHILDREN'S ORTHOPÆDIC HOSPITALS)

TUBERCULOSIS continued again to attract special attention in Singapore and pressure was exerted to expand the work of this division of the medical services far beyond the scope envisaged in the Medical Plan and far beyond anything possible in staff, accommodation and finance in the foreseeable future. Taking all existing circumstances into consideration, the work of this division has been expanded steadily from year to year over the post-war period until by the end of 1950 many times the effort of any previous decade had been reached. Accommodation available is five times the pre-war and will eventually be increased to at least 1,100 beds, while out-patient and in-patient treatment is beyond any comparison with any previous period. Government X-ray examinations alone came to 40,282 as compared with approximately 3,000 in 1938.

The Singapore Anti-Tuberculosis Association has been a most important addition to the Government's endeavour in the out-patient field. It has played an essential part in propaganda and has aroused a public interest in tuberculosis treatment and control. As it issues its own annual review only a reference to its present work is made here.

The main effort by Government has been directed to treating those cases in which the disease can be arrested. Not much has been attempted for the hundreds of very advanced cases for whom nothing satisfactory can be done. Admission of these patients into hospital accommodation, and the institution of modern treatment and good diet, inevitably means a rapid increase in the proportion of chronic wards and equivalent increase in expenditure on family relief. At present nearly half a million dollars is being spent each year on treatment allowances for treatable cases, and this is only the beginning. In the near future Government's annual commitment on tuberculosis control in all its aspects will reach the two million dollar mark, and this is quite apart from the capital expenditure on expansion of the service in the foreseeable future.

While action is proceeding to collect as much standardised information on incidence as possible through X-ray statistics, and plans are in hand for a two-year survey in addition to the material which will be forthcoming from the B.C.G. campaign which is to start in 1951 under the auspices of U.N.I.C.E.F. and W.H.O., the fact remains that crude death rates have still to be relied on for an estimation of the existing position in regard to incidence.

Crude deaths and death rates from pulmonary tuberculosis show a considerable decline since the liberation in 1945, and a striking improvement over pre-war figures. Taking the 1939-41 death average as 100 (2,288 per million), the 1947 index was 70 (1,550) 1948, 65 (1,490) 1949, 57 (1,315) and 1950, 52 (1,193).

The following extract from a World Health Organisation publication is relevant:—

A general decrease in deaths from tuberculosis since 1945—a decrease in some places 'verging on the dramatic'—is reported by WHO in a study covering thirty countries, on all continents. This study, entitled *Tuberculosis Mortality: 1937 to 1949*, has been made by Dr. John B. McDougall, Chief of the WHO Tuberculosis Section.



Public Relations

Tan Tock Seng (Tuberculosis) Hospital Christmas Time

and is published in the latest issue of the *WHO Epidemiological and Vital Statistics Report*. Although the study indicates an improvement in the general tuberculosis picture, Dr. McDougall points out that mortality rates should only be considered as a broad index to the seriousness of the problem.

The most striking feature of the study, which shows a general decline in tuberculosis mortality during the last few years by comparison with pre-war years, is the spectacular post-war fall in death rates from tuberculosis in a number of European countries engaged in hostilities between 1939 and 1945.

France, with rates as high as 134 and 128 per 100,000 inhabitants in 1941 and 1942, respectively, has shown startling improvement in the past several years. The death-rate for France had fallen to 68 per 100,000 inhabitants by 1949.

The report states in the case of Italy, that recovery has been 'in some ways one of the most impressive in Europe'. During the war years Italy suffered widespread increase in tuberculosis. Mortality rates rose to 75 in 1940, 81 in 1941, 102 in 1942 and 100 in 1943. From that point onwards, the report adds, a decline set in. A new low for 1949 stands at 49 deaths per 100,000 inhabitants. This rapid recovery is attributed to the existence of relatively adequate institutional accommodation, and to various economic and social factors.

In Norway recovery since 1945 has also been very significant. The experience of Norway was unique in that the effects of war in increasing tuberculosis rates did not become apparent until the fifth year (1944). The rates for all forms of the disease at that time reached 74 per 100,000. By 1948, however, the figure had fallen again to 52 per 100,000.

Denmark is the only country among those covered by the report which attained a mortality rate as low as 19 per 100,000 by 1949. Moreover, in Denmark there was no increase in death rates during the war years, a fact which some have attributed to the maintenance of adequate food supplies. In World War I, when the country was not actually involved in the war but exported food in large quantities, there was an increase of 20 per cent in tuberculosis mortality. Denmark, according to the WHO report, is 'heading for the last laps' in its effort to control tuberculosis.

Portugal and Spain, two non-participating countries in World War II, maintain, together with Finland, the highest death rates from tuberculosis among European countries included in the WHO report. In 1948, the rates for Portugal and Spain were 148 and 114 per 100,000, respectively, and for Finland, 156 per 100,000. But, while the Finnish rate is falling, this does not yet apply to Portugal and Spain.

During the second World War shortage of shipping facilities to Portugal prevented the importation of essential foodstuffs and the cost of living rose considerably, affecting particularly the lower and middle classes of the population. Yet even since the war there has been little or no improvement in the mortality rates in either Spain or Portugal in contrast to so many other European countries.

A general decline in mortality rates from tuberculosis in recent years by comparison with pre-war years is also indicated in the World Health Organisation study. Only two countries, Portugal and Scotland, indicate an opposite trend. The first shows a 1 per cent increase in 1947-49 as compared with 1937-39, the second a 4 per cent rise for the same period. On the other hand, New Zealand, Denmark, the Netherlands and the United States, which had already reached remarkably low rates before the war, have succeeded in reducing still further their rates by 30 to 39 per cent. The report notes that should the present rate of decrease in mortality from tuberculosis continue in these countries, 'the end of the present century might well find this disease as rare as leprosy is at the present time.'

In presenting the report Dr. McDougall emphasises that the limitation of information to thirty countries is in itself a reflection of the poverty of knowledge with regard to the epidemiology of tuberculosis in the world.

1949 was the first year in which it was possible to collect a sufficient X-ray and clinical assessment of a number of cases to be of any significance. This work has continued but it will not be until the 1951 or 1952 report comes to hand that staff conditions will enable us to sort out enough survey material to be of real value. Figures studied in 1950 for Government monthly personnel on special tuberculosis sick leave showed that 0.8 per cent were suffering from this disease. The groups studied cannot unfortunately be taken as truly representative of the Government Service and so of the public at large as in only one case was a complete survey made. In all the other cases volunteers had to be relied on. So conclusions from these studies on the general position must be subject to the utmost caution.

MASS SURVEY, 1950—GOVERNMENT DEPARTMENTS

Department	Total X-rayed	Total Abnormal X-rays	PRIMARY T.B.		POST-PRIMARY T.B.		SPUTUM		Other T.B. Conditions	Other Pathological Conditions	Under Observa- tion	N.A.D.
			Active	Apparently Arrested	Active	Apparently Arrested	Pos. (+)	Neg. (-)				
Treasury ..	80	8	..	1 (1.2%)	..	2 (2.5%)	..	..	..	1 { Kypho-scoliosis emphysema	3	1
Master Attendant ..	233	17	1 (0.4%)	2 (.8%)	4 (1.7%)	8 (3.8%)	3 (1%)	2 (.8%)	1 Cervical gland enlarged	2 { 1 Bronchiectasis in T.B. patient. 1 Pneumonitis	..	..
Tan Tock Seng Hospital ..	433	3	..	..	3 (0.7%)	..	..	3 (.7%)	..	..	..	..
General Hospital ..	28	3	..	..	..	3 (10%)	..	..	..	..	..	..
Customs ..	8	1	..	..	..	..	..	..	..	..	1	..
Secretary for Economic Affairs	14	1	..	..	..	1 (7%)	..	..	..	..	..	..
Government House ..	45	4	..	..	2 (4%)	1 (2%)	1 (2%)	1 (2%)	..	..	..	1
Telecommunications ..	464	25	..	2 (.4%)	7 (1.5%)	13 (2.7%)	2 (.4%)	5 (1%)	..	2 { 1 Pneumonitis in T.B. 1 Pneumonitis	1	1
Police ..	1,455	60	..	..	8 (.5%)	3 (.2%)	5 (.3%)	3 (.2%)	..	5 { 4 Heart conditions 1 Enlarged liver	37	7
Mental Hospital Staff (female)	35	..	..	..	..	..	..	..	..	..	..	..
Total ..	2,795	122	1 (0.03%)	5 (0.18%)	24 (.85%)	31 (1%)	11 (0.4%)	13 (.45%)	1	10	42	10

In 1949, 2,142 persons examined in the same way gave 0.74 per cent as active.

Definition of Standards

It is necessary to define what method is followed in assessing standards of activity and the apparently arrested. In regard to primary tuberculosis active primary radiological shadows both parenchymal and hilar which persist over a period of three months are taken, both constituents of the complex being visualised and seen to persist. Sputum examinations are seldom attempted although it is well recognised that gastric lavage if repeated will give a high percentage of cultures in active primary cases. Our limited laboratory facilities in any case do not justify this procedure. The criteria for an apparently arrested case or for a primary complex is calcification of either one or both components without radiological change over a period of observation of six months or more. Post-primary lesions have again been divided into only two categories, the following being classed as active:—

- (a) *clinical*—a raised temperature and/or persistent rales over the affected lesion plus a raised sedimentation rate. (A raised sedimentation rate in the absence of other signs of activity is disregarded.);
- (b) *radiological*—radiological progression or regression during a period of observation of three to six months in the absence of other signs of activity is accepted as evidence of activity;
- (c) evidence of pleurisy with effusion;
- (d) *a positive sputum*—either on direct examination, anti-formin concentration or culture.

Apparently Arrested Post-primary

This term was chosen with some hesitation as the word quiescence was thought to be more properly confined to many of the cases under this heading. Possibly the period of observation has been too short to speak in terms of 'arrest'. The criteria for an apparently arrested case are:—

- (a) *absence of symptoms*—absence of radiological change over a period of six months or more;
- (b) *negative sputum*—a combination of (a) and (b) constituted an apparently arrested case.

Under Observation

At the end of the year some 100 cases (children and adults) still remained to be classified due to the shortage of the period of observation.

Survey of Government Departments

This survey was done on a voluntary basis and so cannot be taken as a fair sample of the Government Service, as various influences may have encouraged the individuals concerned to present themselves for examination. If this is borne in mind and a 30 per cent error allowed for it is interesting to consider the figures. The total number of cases of active post-primary tuberculosis discovered in nearly 2,800 Government servants, all of whom had previously passed a medical

TAN TOCK SENG HOSPITAL

Percentage of T.B. cases seen according to Age Distribution for 1949 and 1950

1949—Total cases: Male and Female 2,943 (Black Line)

1950—Total cases: Male and Female 2,478 (Broken Line)

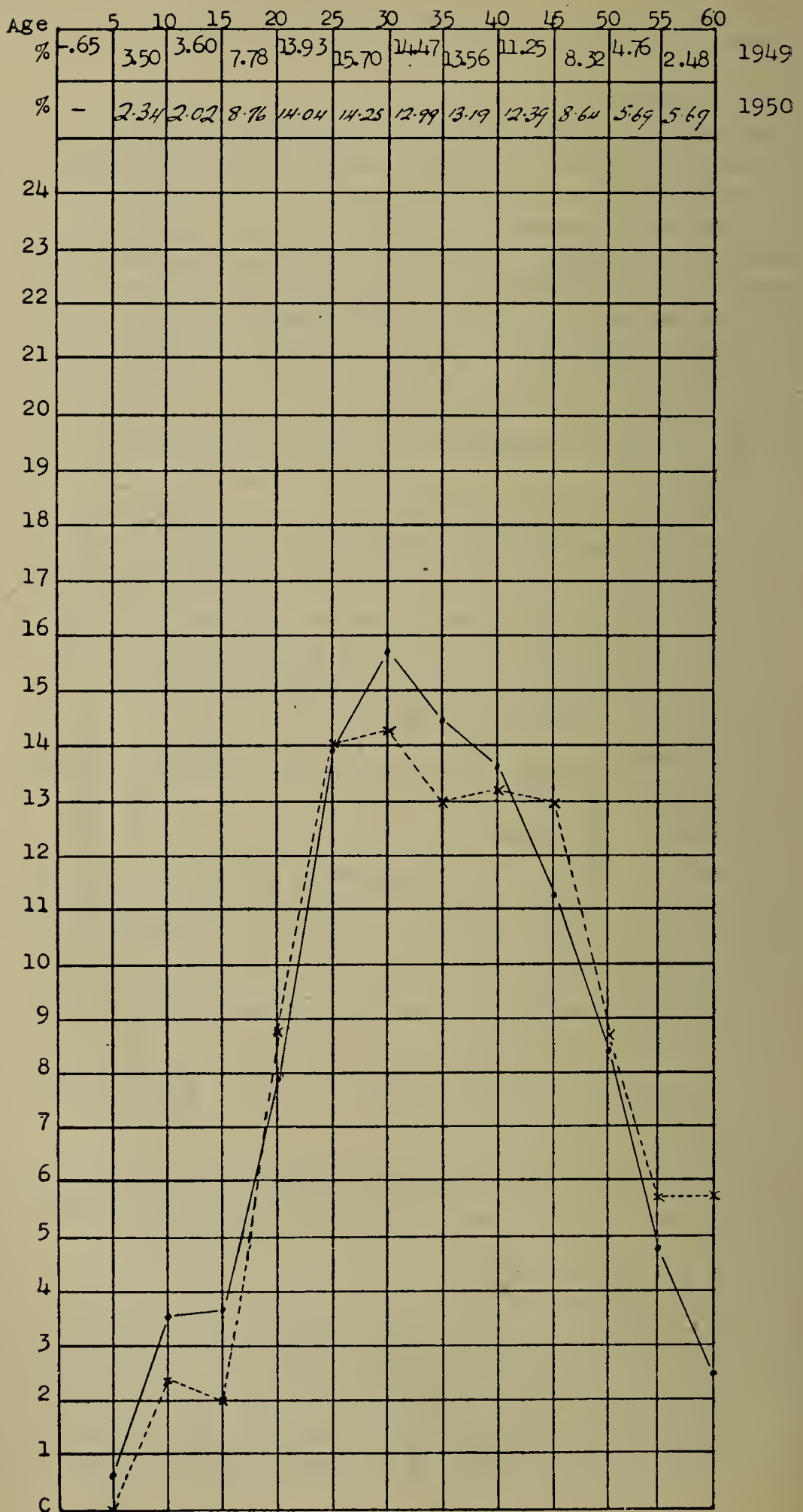


Fig. 9

examination, mostly without X-ray, was 24 or 0.85 per cent. Including a 30 per cent error would mean that something like an incidence of 1 per cent unrecognised tuberculosis exists amongst the apparently healthy adult population. Sputum positives were found in only 11 of nearly 2,800 cases giving a percentage of 0.4 suggesting that less than 1 per cent of the apparently healthy population is disseminating tubercle bacilli in its sputum. Even this assessment adds up to some thousands of dangerous cases however. The numbers in many of the Departments were too small to allow of a comparison between one vocation and another. A number of cases already attending the clinic regularly for treatment, and which were under control and had been returned to work, turned up for the survey and did not make this fact known until they were called up for assessment.

N.B.:—Statistics derived from persons sent for X-ray from the Mental Hospital are noted in that section of the report only as the figures included not only patients from a random survey but also suspect cases. Thus the incidence resulting from this study is high. Out of 74 assessed 3.7 per cent were deemed to be post-primary active.

Statistics derived from school figures record the following:—

Number with T.B. present radiologically	...	...	...	532
Primary complex—active	...	...	...	192
Primary complex—healed	...	...	...	282
Re-infection type—active	...	...	...	49
Re-infection type—inactive	...	...	...	9
Post-primary	...	...	...	—
Total school children X-rayed	...	...	...	5,819

Thus 0.84 per cent of school children showed signs of an active pulmonary lesion as compared with 1.6 per cent in 1949. 0.17 per cent had a positive sputum compared with 0.3 per cent in 1949.

Non-pulmonary tuberculosis appears to have shown a slight increase over recent years. This form of the disease is more usually associated with the use of fresh whole milk and this is not a common practice here. The introduction of more cows and the use of more fresh milk must be kept in mind in this connection however. The greatest care must be taken that all herds are free from tuberculosis in view of the fact that infection from this source is not thought to be a problem so far.

Notification of the disease appears to have been a failure up to date. Whether it can be established on a sufficiently satisfactory basis in such a community as this at the present time as to be of any value is a question which has to be carefully considered. Dr. Morland, a visiting Tuberculosis Specialist from the United Kingdom, was of the opinion that compulsory notification could not be effective without far-reaching economic security measures.

Tan Tock Seng Hospital

<i>Tuberculosis</i>				<i>In-patients</i>
Pulmonary	...	...	...	1,532
Disseminated	...	...	...	4
Bones and Joints	...	...	...	22
Other forms	...	...	...	3

TAN TOCK SENG HOSPITAL

Percentage of T.B. cases seen according to Age Distribution for 1949 and 1950.

1949—Total cases: Males 2,235 (Black Line)

1950—Total cases: Males 1,914 (Broken Line)

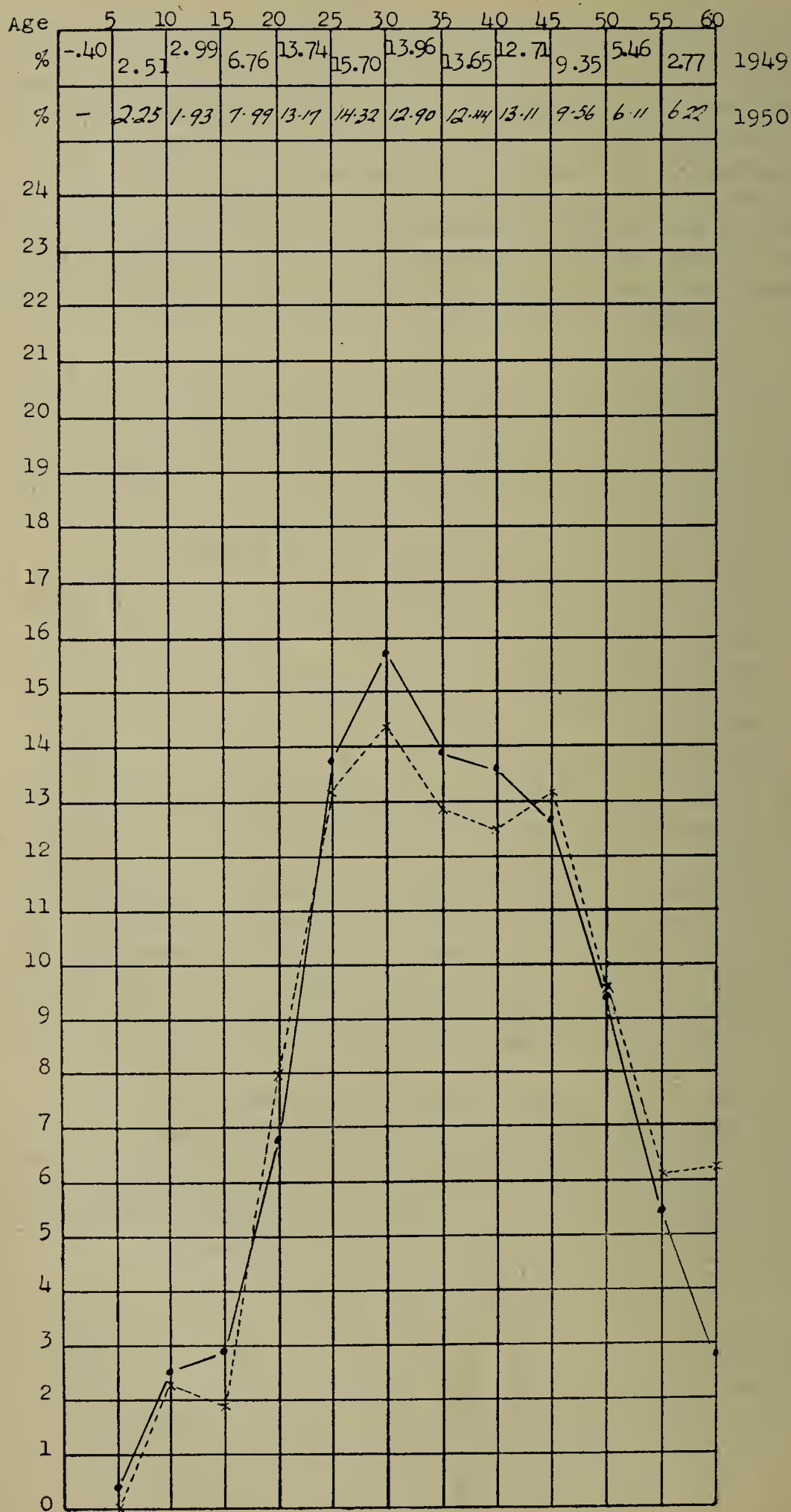


Fig. 10

General Hospital:					In-patients
<i>Tuberculosis</i>					
Pulmonary	...	...	...	...	525
Disseminated	...	...	...	...	50
Bones and Joints	...	...	...	...	135
Other forms	...	...	...	...	249
Orthopædic Children's Hospital:					
<i>Tuberculosis</i>					
Bones and Joints	...	...	...	...	82
Other forms	...	...	...	...	4
Total number of in-patients admitted to the above institutions					2,606

Some 943 tuberculosis cases seen in the out-patients could not be admitted. All cases coming to the Rotary out-patient clinic are registered and treatment started as out-patients. Admission is made from the waiting list of these patients according to their various priorities on medical and social grounds.

When the 3,549 total new cases seen are added to the 41,241 attendances at the Tan Tock Seng Out-patient Department the total amount of work dealt with in 1950 was fifty per cent over that of the previous year and three times that of 1948. The Rotary Out-patient Clinic opened by H. E. The Governor in April, 1949 and a gift from the Rotary Club of Singapore is to a great extent responsible for this, but the steady increase in the numbers coming forward will soon tax even this excellent and modern accommodation to the utmost. Certainly the increased staff available has been stretched to the limit to deal with the present numbers. Out-patient demands must be expected to increase however until more beds are available.

The latest Ministry of Health report in the United Kingdom notes that at the 30th June, 1948, there were 29,420 tuberculosis patients receiving institutional treatment. This represents an increase of 7 per cent over the 1947 figure. The increase in the waiting list, however, is about 12 per cent.

In comparison with the bed state at the end of 1947 a gross gain of nearly 1,600 beds was apparent at the end of June 1948. This gain, however, is reduced to 300 when the increased waiting list is taken into account. The main reason (in more than 80 per cent) for empty beds being temporarily not available is *shortage of domestic and nursing staff*.

Tuberculosis is thought to be present in a higher proportion of Singapore's population than in that of the United Kingdom where some 700 beds are available per million as compared with some 500 in Singapore. Well over 3,000 beds would be required to deal with our problem completely and ideally but even the 1,100 envisaged under the Medical Plan will take us quite a long way along the proper path particularly with the added and considerable out-patient facilities contemplated in various directions. (General, School Medical, Singapore Anti-Tuberculosis Association, Rural Clinics and so on.)

Amongst many thousands of laboratory tests, over 24,000 sputum examinations were carried out during the year, with 19,164 sedimentation tests and nearly 100,000 blood counts.

The clinic laboratory in the hospital caters not only for the out-patient department but also for the hospital wards as well. The three hospital assistants available managed to cover this work but an increase in staff is inevitable. The lack of adequate facilities for culture and for animal inoculation continued to be sorely felt and awaits the implementation of an increased Pathological Division and staff under the Medical Plan.

Screening of cases under Artificial Pneumothorax treatment is done by the medical officers doing the refills who have available to them the opinion of the

TAN TOCK SENG HOSPITAL

Percentage of T.B. cases seen according to Age Distribution for 1949 and 1950

1949—Total cases: Females 708 (Black Line)

1950—Total cases: Females 564 (Broken Line)

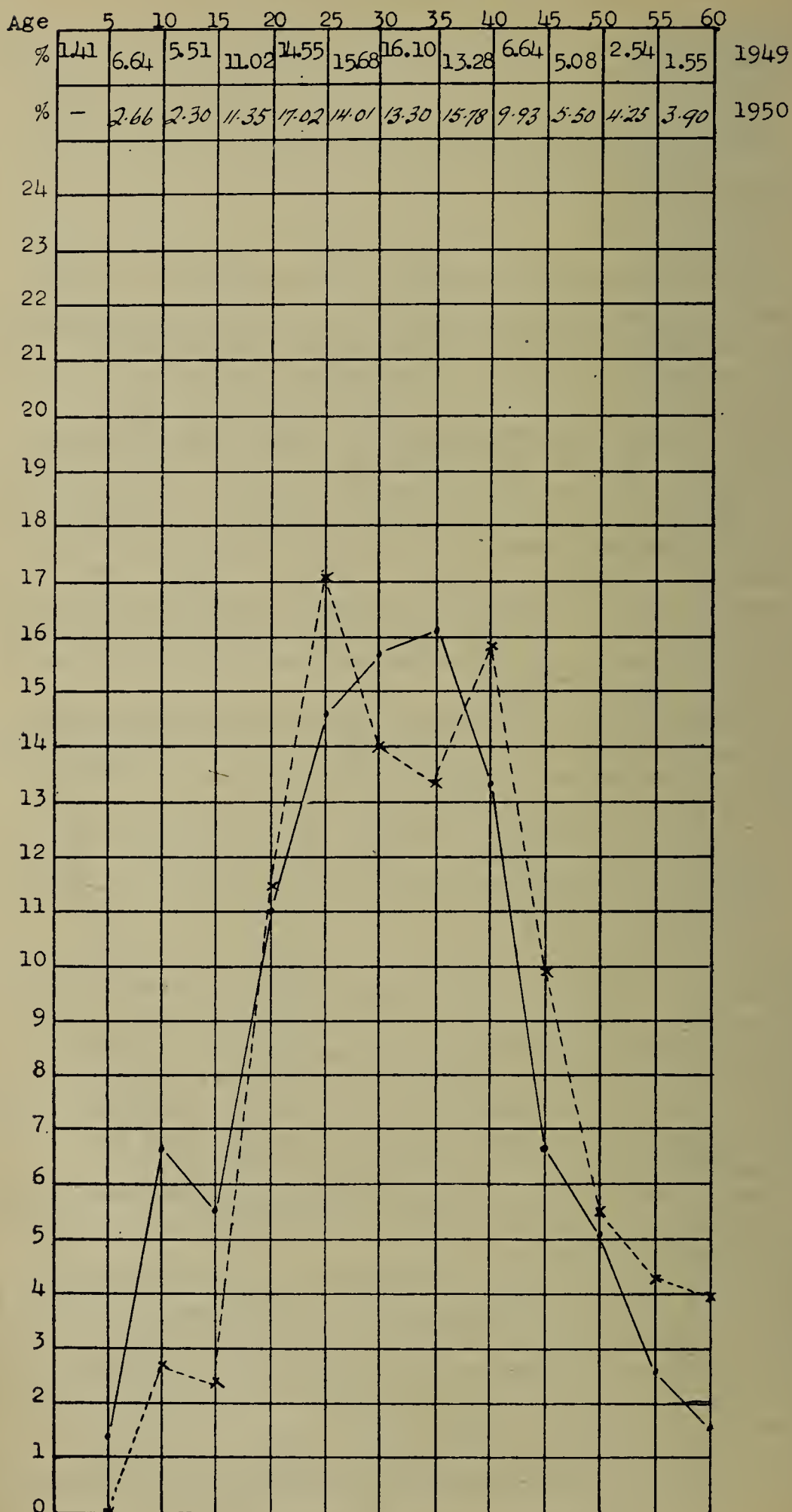


Fig. 11

radiologist when in difficulty. Each week some 250 cases were screened and at the end of the year a new screening room was fitted up with a Phillips Cardanoscopes. The final alterations and fitting up of this machine will not be completed until the beginning of the new year however. This addition will take a considerable amount of work from the main X-ray division where routine screening interferes with normal working.

During the year a new type of case sheet with a heavy cardboard folder to protect it was introduced. While the design is satisfactory and shows all relevant features the paper has proved to be too inferior to stand up to wear as well as one would have hoped.

Small clinical meetings confined to the hospital staff were held each Saturday morning. These have been of great value in clearing up all sorts of clinical problems.

A medical officer from the School Health Division comes to the out-patient clinic on Saturday mornings and there conducts a clinic for school children and teachers suspected or suffering from tuberculosis. All doubtful cases and those requiring active treatment are referred to the Tuberculosis Specialist for his opinion and taken on his list as necessary.

Health Visitors and Contact Cases

Contacts in each T.B. home are visited and dealt with in the following manner :—

Adults	...	referred for X-ray and if necessary assessment to the Rotary Contact Clinic.
School children	...	referred to the School Medical Service.
Infants under one year	...	referred to Lady Medical Officer, Child Welfare.

Non-School Children (under 15 years)

These are tuberculin jelly tested and, if positive, referred to the 'Contact Clinic' for X-ray and follow up. Negative tests are given a second test three months after the first, and a third test six months after the second. Their names have been noted for revisit when the B.C.G. scheme starts in Singapore.

No. of 1st Home Visits	Revisits	Adults referred for X-ray	School children referred to School Medical Service
913	2,424	200	343

TUBERCULIN JELLY TESTS

No. of tuberculin jelly tests done	No. negative	No. positive
1,267	208	1,059

CONTACT CLINIC—TAN TOCK SENG HOSPITAL

Total No. X-rayed	No. of cases referred for assessment	PRIMARY T.B.		POST-PRIMARY		Total No. of Active Primary T.B.		Suspects under observation. (at end of year)	Other T.B. conditions discovered, e.g. T.B. Gland, bone, kidneys	Non-tuberculous significant radiological findings	N.A.D.
		Active	Apparently Arrested	Active	Apparently Arrested	Sputum	Pos. (+) Neg. (-)				
Tub. test pos. (+) ..											
Children 470 ..	161	35 (7.44%)	54 (11.48%)	5 (1.06%)	..	5	..	67 (14.25%)	..	..	349 (74.25%)
Adults 555 ..	81	..	20 (3.6%)	..	26 (4.68%)	..	..	35 (6.3%)	..	..	474 (85.40%)
1,025	242	35 (3.41%)	74 (7.22%)	5 (0.49%)	26 (2.54%)	5	..	102 (9.95%)	..	..	823 (80.29%)

Future Development of the Health Visitor's Scheme

This aspect of tuberculosis control is of great importance and the small start which has been made at the Rotary Clinic will need great expansion if an adequate home visiting scheme is to be possible. A special medical officer will be assigned to this task early next year to a clinic separate from that used for other cases.

STREPTOMYCIN

The wide and growing use of streptomycin has been a source of anxiety to the Medical Authority as there is little doubt that unsuitable cases do get it and the increasing danger from strains resistant to the causative organism cannot be ignored. The following extract from the latest Ministry of Health report available at the time of writing is particularly significant in consequence:—

The advantages and disadvantages of streptomycin therapy and the indications for its use in the various clinical types of tuberculosis have recently been clearly set out by Dr. Daniels, a member of the scientific staff of the Medical Research Council. 'In tuberculosis', he writes, 'serious consideration of the possibilities and limitations of chemotherapy is essential; the dangers of excessive use are as great as those of ignoring the cases in which chemotherapy may lengthen or actually save life The main weapon against tuberculous disease lies in the body's own defence mechanisms; chemotherapy must serve mainly the purpose of supplementing these defences at a time when they are low or when the bacterial onslaught is particularly heavy It is now accepted that in meningeal and miliary tuberculosis streptomycin provides the most effective treatment so far discovered; in some tuberculous conditions it may be considered a useful adjuvant to other forms of therapy but it does not in any way replace them; in others it is of little or no value'. After discussing the relative effectiveness of streptomycin in the treatment of the various forms of tuberculosis and the development of streptomycin resistance he continues: 'These facts render imperative the careful selection of cases for treatment and especially the careful choice of the right time for streptomycin, since it may not be possible to give further effective courses. Furthermore, they indicate that the drug should not be used indiscriminately, and in particular not for chronic patients likely to remain sputum-positive, as the public health risks of disseminating drug-resistant tubercle bacilli are considerable'. Among his conclusions he states 'Orthodox treatment and orthodox preventive measures will remain important for many years to come.'

On an average about 50—60 in-patients are receiving injections of streptomycin daily chiefly for exudative lesions, for miliary tuberculosis and for tuberculous laryngitis.

P.A.S. alone has not produced the results claimed for it by some of its proponents. It is now always used in conjunction with streptomycin for the purpose of preventing the development of resistant strains.

Sulphone—Nine cases of advanced pulmonary tuberculosis were tried on a five months course of sulphone injections. The results were disappointing.

Dibromopropamidine—Four cases of tuberculous pyothorax were treated either by instillation or irrigation with this new preparation from May and Baker. Secondary organisms were very quickly dealt with but tubercle bacilli were still cultured from the pleural pus after completion of the course of treatment. In one case there was a very severe reaction—intense headache with a temperature of 104°—105°. These symptoms immediately subsided with the withdrawal of the drug.

B.C.G.

In 1949 the Ministry of Health reported as follows:—

The year 1948 was a year of decisions followed by the detailed work necessary to give shape to the practical application of the scheme for B.C.G. vaccination. Thus it was decided to introduce the scheme in the coming year, using a strain to be obtained from Copenhagen. Dr. F. R. G. Heaf was appointed consultant adviser in B.C.G. to the Ministry of Health and, at the turn of the year, led a party of doctors, nurses and

administrators to Copenhagen to study detail. Plans were made for obtaining supplies of the vaccine from Copenhagen and for distributing them in this country. At the same time standard forms of record were drawn up and administrative machinery for handling them devised, a medical memorandum (322/B.C.G.) was drafted and circulars to the appropriate authorities put in hand. The intention in the first place is not to encourage general inoculation of the public at large but to concentrate on those groups of the population considered to live at a more than average risk of tuberculous infection.

Note:—The first consignment of B.C.G., vaccine arrived by air from Copenhagen at Northolt on 3rd October, 1949.

The Director was able to see the preliminary work which had been instituted in the United Kingdom during his 1950 study tour and action will be taken by a team of Danish experts to commence operations in Singapore in 1951. This team started in Johore Bahru towards the end of the year and it is working to a definite programme with the wet vaccine in the Federation and in Singapore.

B.C.G. is a form of preventive inoculation against tuberculosis in infants and persons in whom the infection has *not* occurred. It is useless and dangerous to those who have acquired the disease or immunity against the disease. The Singapore Anti-Tuberculosis Association continued a small scale scheme of vaccination with the Pasteur Institute dry vaccine on contacts of cases under treatment at their clinic where they use the scarification technique.

THE TUBERCULOSIS ALMONER'S REPORT

The Almoner's division at the tuberculosis centre commenced work in January 1949 in a small way as the Almoner in charge was only able to give part time service and unfortunately had to leave towards the end of the year. From January until March, 1950, the routine work on the T.B. Allowance Scheme was carried on by a health nurse until a new full time Almoner was appointed. On 1st May a clerk interpreter became available.

Only one Almoner responsible for the welfare of the very large number of patients attending as out-patients, together with those in the wards, raised the problem of the best method of working. To carry out the real principles of almoning there should be adequate time to investigate the circumstances of each patient and to gain his or her full co-operation, plus tackling outside sources of help. This procedure would have put a strict limit on the number of patients seen obviously. This was clearly impossible, for as the almoner became known to patients so more came to appeal for help. It was decided therefore to meet the pressing needs of assistance in the mass and to curtail detailed casework temporarily until the staff could be increased.

It was felt, however, that this procedure meant a distinct loss at a time when interest in tuberculosis welfare work was stirring and when much assistance could be gained to the advantage of the patient.

Within these limitations an attempt was made to:—

- (a) see every new patient on his first attendance at the out-patient clinic and again when his treatment had been decided on: to discuss how his life could be adjusted to this new method of life and to assist in every way possible;
- (b) discuss fully with the patients placed on T.B. allowances their obligations under the scheme and the purposes of the restrictions imposed: to try and remove any barriers to their carrying it out: in fact the care of the family while the bread-winner is unable to work;

- (c) assist as far as possible the far advanced cases and to arrange for the examination of their contacts;
- (d) supervise the monthly reports of every patient on the T.B. allowance scheme;
- (e) assist patients when fit for work in finding suitable employment;
- (f) find accommodation for the homeless;
- (g) deal with the boarding out of young children while the mother requires hospitalisation, or when either parent is particularly infectious;
- (h) co-operate fully with the Health Visitors' division (very close liaison must be maintained over the supervision of all patients on T.B. allowances).

Almoner's Fund

In the course of this work it became necessary on many occasions to give financial help which was not always available under Government Funds. It was agreed that donations by patients and employers should be put to an Almoner's Fund to be used at the latter's discretion.

Statistics

Number of patients seen	...	...	...	...	8,720
Number of ward patients	...	...	...	...	619
Referred for T.B. Allowance	...	...	...	...	591
Referred for General Relief	...	...	...	...	366
Referred by Health Sister	...	...	...	...	632
Number of surgical appliances	...	...	...	...	11
Helped by Almoner's Fund	...	...	...	...	19
Work found by Almoner	...	...	...	...	25
Work found by Labour Exchange	...	...	...	...	5
Referred to Labour Exchange	...	...	...	...	50
Helped by various organisations	...	...	...	...	30
Number repatriated	...	...	...	...	9

At least two more almoners are required to cope with the present work. It is proposed to take on two local Chinese girls as almoners in due course; and more routine assistance is urgent.

The present scheme of T.B. allowance entails much routine work which should not be dealt with by the almoner herself. The Social Welfare Department employs investigators on similar work and it is this type of person who is required. Experience has shown the real necessity for a larger almoner's fund. The supervision of contacts and all types of cases requires a much extended health visitors division.

TUBERCULOSIS TREATMENT ALLOWANCE

Domiciliary Relief became an important and vital part of the local tuberculosis scheme for the first time in our history during 1949 following one of the main recommendations made in the Tuberculosis Policy Paper prepared by the Medical Department in the previous year. Domiciliary relief was given to children as part of the School Medical Service in those cases where hospitalisation could not be arranged at an annual cost of \$12,953.32 while extras such as milk were provided to all infant welfare centres at a yearly figure of \$75,000.

All adult cases receiving relief are subject to review by a Committee operating under the auspices of the Social Welfare Department which had \$228,491 at its disposal in 1950. The School Service provides a visiting team to administer its home relief and this work is reviewed briefly in the appropriate section of this report. In the case of adults all patients are referred to the Almoner with a note from the Medical Officer stating whether they are medically eligible for the benefits under the scheme. Only tuberculosis patients who are in need of financial assistance, and have a reasonable chance of recovery if provided with medical treatment and sufficient funds to allow them to rest, are eligible for allowances under the scheme. Cases must have been undergoing regular treatment in Tan Tock Seng Hospital or in the Singapore Anti-Tuberculosis Association Clinic and must be recommended by the Medical Officer concerned who in addition to certifying that in his opinion they have a fair chance of recovery also recommends the number of months allowances should be paid, which period may be extended on the further recommendation of the Medical Officer. The Form of Recommendation is forwarded by the Almoner of the hospital or by S.A.T.A. to the Department of Social Welfare whose staff investigates the economic circumstances of the cases, checking the number of dependents, the patient's former average income and similar details. This investigation is conducted by the Public Assistance Section of the Social Welfare Department. The Supervisor of the Section examines each case, assesses the need, taking into consideration income from other sources, and calculates the treatment allowance in accordance with the scheme drawn up and approved by the Committee. This detailed report is submitted and approved before a payment can be made. In many cases this approval is made by the Social Welfare Department direct, these being only reported to the Advisory Committee for covering approval, but where there are special circumstances, calling for larger or smaller allowances, these have to be submitted to the Advisory Committee at its monthly meeting for consideration. Even in these cases an interim payment within the rates laid down can be paid, subject to adjustment later on. All cases receiving domiciliary relief must report to the Almoner and to the Medical Officer of the hospital for a monthly report.

When patients reach the end of the period for which their allowances were granted and they are reported to be fit to return to their former employment, or to undertake light work, the Advisory Committee, the Department of Social Welfare, and the Almoner of the Tan Tock Seng Hospital co-operate in finding suitable work for any who remain unemployed, or intercede with employers to re-employ them. The following examples indicate the rate of allowance per month :—

						\$
T.B. out-patient	...	...	...	...	...	45
T.B. in-patient	...	...	...	...	...	15
Wife	...	...	...	...	...	25
Every dependant 16 and over	...	...	...	...	...	15
Every dependant under 16	...	...	...	...	...	12
Increased allowance for single person living alone	...	...	...	...	...	10
Rent payable	...	...	...	...	actual rent paid	
Special allowance for T.B. wife whose husband's income is very meagre:						
out-patient	...	...	...	...	...	35
in-patient	...	...	...	...	...	10

All rents over the limit of \$15 a month are subject to the approval of the Advisory Committee. Income from all sources, such as paid leave and wife's or dependants' income is deductible from the total treatment allowance given.

The object of the scheme is to help out the wage-earner who cannot work because of his disease: and to assist families unable to provide for sick dependants. So a new start has now been made in Singapore in one of the most essential parts of any tuberculosis scheme. The occurrence of tuberculosis in any family is a disaster. In many it is economic obliteration.

During the year over 350 patients who were drawing allowances under the Scheme were certified fit for work. The average allowance paid to each case was \$62.34 per month and the average number assisted per month was 305.

A feature was the excellent co-operation between the S.A.T.A. Clinic, Tan Tock Seng Hospital and the Social Welfare Department. This combination gave the scheme its effectiveness.

It is believed that the scheme is the only one of its kind in existence in the Far East.

Cases considered too far advanced to be eligible for the Treatment Allowance Scheme were recommended to the Social Welfare Department for assistance from the Silver Jubilee Fund. Rates of assistance from this fund are considerably lower than the rates noted above.

The Diversional Therapy Unit and its splendid work has been adequately described in the section in this Report dealing with voluntary organisations. The work consists chiefly in providing materials to patients and teaching them to knit, to embroider, to make toys, and basket design of various kinds. During the year the number of trained patients rose from some 60 in 1949 to 360. Although 30 ladies are giving much time and thought to this essential to modern tuberculosis treatment, more helpers are urgently required to expand the scheme and to replace those who have to leave Singapore.

It must be repeated that a main effort is directed to relieving the burden of the afflicted family and this often entails a great deal of work before a suitable solution is found. Some firms in Singapore have shown marked consideration to members of their staffs by keeping jobs open for short periods and continuing to pay full or half salary while the patient undergoes treatment. Others have agreed to employ another member of the family in place of the wage-earner. One firm even granted a widow a sum sufficient for the support of her family while she trains as a mid-wife. All are not as co-operative as this, however, and other avenues have to be explored in obtaining relief. This is where the Almoner comes in.

Every effort is made to obtain employment for members of an afflicted family and the special child help scheme which is run by the School Medical Service also comes into the picture. The nurses visit those patients who have been referred to the Lady Almoner—to examine home conditions; to advise on general measures of health and hygiene; to teach and to safeguard other members of the family from infection; to arrange for contacts to attend for examination and to visit patients who are on home treatment while awaiting admission to hospital.

Thus the Government Medical Service is achieving albeit slowly the first phase of its Tuberculosis Policy which is as much hospitalisation plus domiciliary relief follow up as possible: an expanded School Medical Service: an expansion in other child medical services with a concentration on feeding and

case follow up. Children are to receive a large part of the added attention which these proposals will make possible. Dr. Morland laid particular stress on the removal of the economic penalty of tuberculosis, and suggested top priority in this respect in our approach to the problem. This advice is being kept in mind.

Two difficulties which have to be faced are the doubtful or suspected child—the child who *may* develop the disease and is in a bad environment—and the chronic case for which nothing medically can be done. Neither of these categories comes into the true curative picture, although both may well be a part of domiciliary relief. A form of home sanatorium is required for the former and this is a part of the Colony's scheme where voluntary assistance will play a further important part it is hoped. The latter may well require a special form of institutional treatment in this part of the world. The old idea of a form of dying house for this sort of people is not the answer to the latter problem. In consequence a cheap solution is out of the question. Both these categories require removal out of a bad environment, the former as a priority towards a healthier generation, the latter as a danger removed. Both these types represent prevention as distinct from cure. So many cases of this type exist, however, in Singapore that housing improvement is the main protection. Singapore is in large part a 'cubicle city', and where the neglect of past decades has created such slum conditions the surprising thing is that tuberculosis is not rapidly increasing. A considerable resistance must have been built up by the local population.

FURTHER NOTE ON TAN TOCK SENG HOSPITAL

In-patients

			<i>Total treated</i>	<i>Deaths</i>
Respiratory Tuberculosis	...	...	... 1,532	148
Other Tubercular Diseases	...	...	... 29	4
Other Diseases (mostly chronic)	...	...	... 494	68
Total			... 2,055	220

Percentage 10.71

Out-patients

			<i>New cases</i>	<i>Repetitions</i>
1950: { T.B. Cases	...	...	... 2,478	41,241
Non-T.B. cases	...	...	... 5,222	9,531

Accommodation

As some 400 beds were in use towards the end of the year for tuberculosis at Tan Tock Seng Hospital it is clear that this institution continued to be the main centre for this disease in Singapore. The opening of the Rotary Clinic within its grounds in April 1949, with X-ray and other necessary units attached, has made what was a very poor out-patient department a really up to date one. The tuberculosis out-patient attendances continued to show a further considerable increase during the period under review. Non-tuberculous attendances remained about the same. In-patients suffering from tuberculosis increased from 817 in 1948 to 1,561 in 1950.

Other diseases admitted totalled 494 during the year. Tan Tock Seng Hospital has still to cover an acute in and out-patient duty, in view of the overworked General Hospital. It also acts as a chronic disease overflow from that institution. In consequence of this latter feature valuable beds had to be utilised for a proportion of cases more suitable to a decrepit home than to a medical institution.

Of the twenty-six wards available at the hospital only eighteen could be put into full medical use during the year as three had to be reserved for staff accommodation, one was used as a dental clinic and one for diversional therapy. Thus three still remained empty. Of these two will have to be reserved for assistant nurses. The rest of the accommodation remaining will be used as a self help tuberculosis centre for the more chronic cases as an experiment in the direction of camps for in-patients in the incurable category.

Admission and Waiting List

Admission to the tuberculosis section of the hospital has been by waiting lists. These lists have been sub-divided according to the clinical urgency of admission. For instance a severe haemoptosis case would be admitted immediately for a short period until the bleeding had been controlled and then take his turn on the waiting list for the type of disease from which he suffers. Cases which will benefit from active treatment and for whom there is a hope of arrest are admitted on a combined medical and time priority to the treatment wards. The very advanced cases are admitted more on a social priority and the allocation of 68 beds on the male side and 32 beds on the female side for this purpose is only a token one. The vast majority of these cases have to stay outside the hospital. The Almoner has managed to get a number placed in the 'Chinese' hospitals in the town but a majority still stay at home.

Experiment on Chronic Tuberculous Admissions

An attempt was made during the year to extend the accommodation for chronic tuberculous patients who were homeless and yet who could help to look after themselves. This was done by opening one further ward for thirty-six patients with fibrocaceous disease with cavities and positive sputum. These had to help in the running of the ward, i.e. they were asked to do some light work in batches of six, such as sweeping, dusting, pulling back the mosquito nets, making the beds. More intelligent patients were asked to supervise the issuing of routine medicine, food and linen.

The hospital staff concerned in the experiment was cut down to a minimum, i.e. two hospital attendants. A Sister and a Hospital Assistant from a neighbouring ward merely kept a watch to see that everything was satisfactory. The cleaning gang continued to do the heavy work in the ward.

A number of cases proved to be a little too advanced and toxic for this experiment. These quickly deteriorated and had to be transferred to the wards for the very advanced. Only six cases improved. One was transferred to the General Hospital for thoracoplasty. Hæmoptysis occurred in seventeen and seven had to be transferred to the wards for advanced cases. The frequent occurrence of hæmoptysis means that these patients cannot be left on their own. The nursing of the hæmotysis case in bed necessitates the presence of some trained staff in the wards all the time, with a doctor on call.

Staff

Tan Tock Seng Hospital had the services of a Tuberculosis Specialist throughout the year. Up to November, Dr. C. E. Smith, L.M.S. acted in this capacity when Dr. R. J. Grove-White, M.D. (Dub.), M.R.C.P. (Ed.) took over. Dr. A. L. Greenway, M.B.E., M.R.C.S., L.R.C.P., was the Medical Officer in Charge. One Tuberculosis Specialist and the equivalent of four full time Medical Officers is not sufficient to deal with such a large and expanding in and out-patient organisation as this.

The nursing staff of one Matron, four Sisters, thirteen female nurses and sixty-six nurses was augmented during 1949 by four nursing nuns from the Franciscan Order of the Divine Motherhood and these ladies are in the process of forming a special tuberculosis nursing service for a part of the institution. Thus the nursing standards at this hospital should be considerably improved in due course.

All members of the staff are tuberculin tested before starting work at Tan Tock Seng, and only those who show evidence of immunity to tuberculosis are permitted to work in the wards. All undergo a medical and X-ray examination and are subsequently examined every six months. Probationer nurses coming to Tan Tock Seng Hospital are examined both before and after their three months tour of duty.

All members of the staff receive fresh milk daily and strict attention is paid to seeing that all have regular days off and requisite leave.

FOOD

At the beginning of the year complaints were made by patients of the quality of the food, particularly the fish, and that meals served were cold.

A sub-committee was formed under the presidency of the Deputy Director of Medical Services and the following members: Dr. Chen Su Lan—a member of the Management Committee, Medical Officer in Charge, Tan Tock Seng Hospital, Matron, Tan Tock Seng Hospital. Dietitian, General Hospital, and two ladies co-opted by the member of the Management Committee.

Two meetings were held, since when no further complaints have been made as is borne out by the remarks of the monthly visitors from the Management Committee.

Through the efforts of this sub-committee a large sized commercial type of refrigerator was purchased for the kitchen for the storage of various food-stuffs. The food so stored can be cooked as and when required and is therefore more palatable.

Food is sent out very hot from the kitchens and though it remains hot enough till served it was considered that a better proposition would be to obtain insulated containers which remain at standard temperature for one hour. These will be ordered early in 1951.

Following repeated consultations with the contractor, the standard of eggs has improved considerably.

INSTALLATION OF DISH-WASHING MACHINE

A special dish-washing machine is being purchased and is to be installed in the near future. This machine will not only clean the plates, but it will sterilise them at the same time. Thus the fears of patients regarding the transmission of disease from one to another should be allayed.

The rehabilitation of the hospital was started on in earnest during 1949 and continued during 1950. A tremendous amount still remains to be done to reach the level of the 800 bedded sanatorium hospital envisaged under the Medical Plan however.

During the year 514 patients were submitted to phrenic crush. This small but useful operation, resulting in the temporary paralysis of one side of the diaphragm, has an important place in collapse therapy.

Sixteen cases for thoracoplasty and seventy-five for pneumolysis were referred to Mr. Mekie's surgical unit, General Hospital. It has been suggested that the surgical viewpoint might well be represented at the weekly clinical meetings held at the hospital. These meetings are in the nature of a discussion on medical and surgical aspects of tuberculosis. As the Singapore scheme advances the surgical side of tuberculosis must receive more and more attention until a proper surgical chest unit can be established.

FURTHER NOTE ON THE CHILDREN'S ORTHOPÆDIC HOSPITAL

Apart from the eighty-two children who were treated as in-patients at this institution during the year for various forms of bone and joint tuberculosis a number of chronic post poliomyelitis cases received attention. A factor is now the special diversionary therapy and the trained physiotherapists who visit the patients. A general nursery school was continued throughout the year for these unfortunate prolonged bed-ridden cases.

COMMITTEES

There is a Government Tuberculosis Advisory Board to guide the Director in the best way of implementing general policy, particularly in regard to the accommodation available. Representatives of Rotary, Singapore Anti-Tuberculosis Association and the Social Welfare Department sit on the Board in addition to the Senior Radiologist and senior Health Officers. The Domiciliary Relief Committee operates under the auspices of the Social Welfare Department with a liaison with the Tuberculosis Specialist. The Deputy Director is a member of the Council of the Singapore Anti-Tuberculosis Association.

CHAPTER TWENTY

VENEREAL DISEASE

THE Social Hygiene Division, accommodated in a 70 bedded hospital with male and female clinics situated in a densely populated part of the city and in a clinic in the dock area, records considerable advancement during the year. Its activities are directed towards the diagnosis, treatment and control of venereal disease.

Notable progress has been made in expanding the scope of the 'contact and follow-up' section. The laboratory has been improved by the provision of proper work-benches and an incubator for cultures. Co-operation of the Service's Laboratory has been sought and liaison established for the carrying out of Wassermann and Colloidal Gold Tests on specimens of cerebro-spinal fluid, as such facilities have not yet become available at the Government Pathological Department. Contact with the rural population has been initiated by means of a Travelling Social Hygiene Dispensary. A steady increase in numbers both for in and out-patients as well as total attendances has been an encouraging feature of the year.

The educational sphere has been enlarged. Not only have students from the University of Malaya been regularly trained throughout the year, but a report on 'Keratoderma Blenorrhagica' has been published in the local medical press, and a paper on *Some Social Aspects of Venereal Disease in Singapore* was read at the Pan-Malayan Annual Meeting of the Alumni Association of King Edward VII College of Medicine—now the Faculty of Medicine, University of Malaya.

With the approval of the Venereal Disease Committee, antibiotic prophylaxis for prostitutes has been instituted. (See later).

ATTENDANCES

There is no indication that the treatment of neisserian infection in an institution separate from the main hospital prevents attendance. Indeed it is common practice for patients suffering from venereal disease to recommend the hospital to their friends, whatever the nature of the illness. During the year 1950 in-patients numbered 2,617 with a monthly average of 213. Total new out-patient cases numbered 15,249 and total attendances were 105,592. Comparison with previous years is as follows:—

			<i>In-patients</i>	<i>Out-patients</i>	
				<i>New cases</i>	<i>Total Attendance</i>
1947	...	...	2,129	10,605 (females 2,540)	44,990
1948	...	...	2,478	12,986 (females 3,047)	72,913
1949	...	...	2,221	14,478 (females 3,721)	96,258
1950	...	...	2,617	15,249 (females 3,884)	105,592

Particular attention has been paid to women over the post-war period. New female cases are now nearly five times the pre-war figure recorded. It is to be noted, however, that this increase has no bearing on increased incidence but rather on the new methods of approach and treatment employed. No comparative incidence figures are available.

The clinic in the dock area, primarily for seamen, records the following attendance during the years 1948, 1949 and 1950:—

					<i>New Cases</i>	<i>Total Attendances</i>
1948	...	...	...	...	2,582	17,577
1949	...	...	...	...	2,966	24,463
1950	...	...	...	...	3,271	25,439

With all the modern treatment and laboratory facilities now at our command it has not been expedient to further postpone the correct follow through in diagnosis, and the increasing number of lumbar punctures requiring to be done will take up a certain number of in-patient beds in the coming year.

Middle Road Hospital has been greatly improved during the last five years, although accommodation, particularly for the male section, continues to be insufficient for the number of patients seeking treatment. The building is equipped with thirty-five female and fifteen male beds, and there are eight cots for children. In addition accommodation has been made available for ten young girls in a separate ward. These girls are referred by either the Social Welfare Department or the Anti-Vice Squads of the C.I.D. for diagnosis and treatment, and for detention if necessary.

Dr. L. M. Ram, M.B., B.S., M.R.C.P. (Ed.), D.P.H. (Lond.), the Senior Medical Officer in charge of Singapore's Venereal Disease Division makes the following remarks in regard to incidence:—

As in England and America, the immediate post-war years have been abnormal ones in Singapore. During the Japanese occupation no drugs were available for the proper treatment of such diseases. From 1945 to 1949 a great 'backlog' of cases had naturally to be dealt with and the organisation of the department had to be constantly modified to meet this increased demand. For an estimate of normal incidence and prevalence of venereal disease in Singapore it would appear to be more correct to take the 1950 figures as the basis for comparison with similar areas elsewhere. Double reporting of a case from both clinics has been avoided and only cases reporting for the first time have been shown as new cases. Old cases of previous years, re-infections, and relapses have been included in 'Attendances' only.

A comparison for early syphilitic infections dealt with for the first time in this department with a port like Liverpool is as follows:—

		<i>Year</i>	<i>Early syph. infections</i>	<i>Population</i>	<i>Rate per 1,000</i>
Merseyside	...	1948	642	1,106,390	0.6
Singapore	...	1950	1,634	1,000,000 (est.)	1.6

The highest rate in any port in England is found in Manchester (982 cases in a population of 875,700, i.e. 1.1 per 1,000) and the lowest perhaps in London (2,019 cases in a population of over 8,000,000, i.e. 0.25 per 1,000).

The figures quoted show the distance Singapore has yet to travel on the road to control of these infections. England however is a much more advanced and developed country with a homogeneous population of high standard of education, and the comparison therefore is not strictly scientific, although it might be noted that incidence of early syphilis in Singapore would appear to be little more than that in Manchester. Comparison with Jamaica may be of interest:—

		<i>Year</i>	<i>New Cases of Syphilis and Gonorrhœa</i>	<i>Population</i>	<i>Clinic Admission Rate per 1,000</i>
Jamaica	...	1948	21,675	1,350,000	16.0
Singapore	...	1950	6,624	1,000,000	6.6

In general there is no doubt that control of venereal disease in Singapore compares favourably with similar areas in the East or West.

CONGENITAL SYPHILIS

This is at present a serious Public Health problem. The defaulter rate in the clinics for treatment of early syphilis is very high amongst the male patients, although it has been steadily falling during the last four years from 78 per cent in 1947 to 58 per cent in 1950.

Such large numbers of incompletely treated cases keep on adding every year to the potential reservoir of infection, and most of them are liable to infect their conjugal partners who in turn infect their offspring. The best remedy, of course, would be to find and treat the infected pregnant woman. Due to shortage of staff and administrative difficulties, it has not yet been possible for any Government institution or rural and municipal clinics to carry out routine antenatal blood tests. Only suspected cases have been so examined. It is hoped to examine all antenatal cases in rural clinics in the near future with the development of the travelling dispensary service however.

117 new cases of congenital syphilis below the age of one year have been treated during 1950. Another twenty have been admitted to the General Hospital.

CONTACT INVESTIGATION

This section has been re-organised. A family unit system of contact has been introduced and new cards printed for easier record keeping. All defaulting cases of gonorrhoea and syphilis in the male section are contacted with variable success by writing a letter asking them to report at their earliest convenience. At their first interview, married men are given a letter to be handed to their wives requesting these to report for examination also. A weekly list of all married men, with addresses, is sent by the male clinics to the contact section as well. If the wife does not attend, a lady supervisor is instructed to make a propaganda visit when she is on her routine visit to that area. The defaulting husband is still contacted by letter only. A woman is induced to bring her children too.

It has not been possible to analyse the figures but the impression gained has been that quite a large number of conjugal partners seem to escape infection even during the infectious stage of the disease.

The follow-up of female defaulters has as in previous years been reasonably satisfactory. 5,006 such visits were made by the supervisors during 1950 and 342 new homes contacted for propaganda purposes. On the average 25 families per month (both old and new) have been examined and treated when necessary, and regular follow-up arrangements instituted, thus enabling this section to make a real contribution towards the control of venereal disease and prevention of re-infection of conjugal partners.

Another important function is to maintain liaison with the Social Welfare Department, the Service and Civilian Police departments concerned in prevention of prostitution, and those responsible for the rehabilitation of juveniles. The Army, Navy, R.A.F. and Civilian Police have deputed two, one, three and six men respectively for the job of contacting and tracing sources of infection of Service and Civilian personnel. During the current year 37 women over the age of 18 years and 147 under the age of 18 years were referred by the Social Welfare Department for diagnosis and treatment.

In addition 79 prostitutes—all new cases—attended the out-patient clinic. Altogether there are 787 prostitutes now on the records of the clinic.

Out of 5,566 male patients suffering from venereal diseases who were questioned about the source of infection 5,388 (97%) attributed it to the professional prostitute. This led to the institution of antibiotic prophylaxis for such women to control and shorten the infectivity period through weekly injections of Procain Penicillin in oil with aluminium mono stearate. This experiment was launched only recently and 117 cases have so far been registered for such treatment. Time alone will reveal the usefulness of such an experiment.

ROUTINE WORK IN THE CLINICS

That this has greatly increased is shown from the following figures:—

	1949	1950
1. Blood specimens for Kahn Tests ..	15,339	22,585
2. C.S.F. Examination and Kahn and W.R. ..	78	638
3. Dark Ground specimens ..	4,810	7,192
4. Smears for Gonorrhoea ..	9,046	11,381
5. Number of total injections ..	169,563	184,921
(i) Aqueous penicillin G used ..	6,319 mu	6,140 mu
(ii) Procain penicillin in oil with alumin- ium mono sterate ..	2,202 mu	11,903 mu
(iii) Arsenical injections ..	24,045	28,103
(iv) Bismuth injections ..	21,670	22,880
6. Culture for Gonorrhoea ..	..	257

The number of cultures has been limited only by the short supply of culture media.

TERTIARY SYPHILIS

253 cases in the male clinics and 53 in the female section have been so diagnosed. The following table gives the break down by nationality:—

	Gummata and ulcers skin	Bones and Joints	Cardio- vascular	G.P.I.	Tabes	Other Neuro- syph.	Total
<i>Male Cases</i>							
Chinese ..	50	45	14	16	17	36	178
Indian ..	15	14	4	2	3	11	49
Malayasian ..	6	9	3	1	3	2	24
Others ..	2	..	..	..	..	..	2
<i>Female Cases</i>							
Chinese ..	15	5	11	2	2	12	47
Indian ..	1	..	..	..	..	..	1
Malayasian ..	1	..	1	1	..	1	4
Others ..	1	..	..	..	..	..	1
Total ..	91	73	33	22	25	62	306

American experience shows that neurosyphilis is much more prevalent amongst the whites and cardio-vascular in negroes. Other authorities have stated that Asians are more prone to skin and bone tertiary lesions than neurosyphilis. In Singapore in a more or less stabilised period the ratio appears to be:—

Neurosyphilis	...	...	...	35.6 per cent
Cautaneous	...	...	...	29.7 per cent
Bone and Joints	...	...	...	23.9 per cent
Cardio-vascular	...	...	...	10.8 per cent

SEAMEN

939 seamen were treated during the year at both Middle Road and the Dock Area Clinics:—

MIDDLE ROAD AND DOCK AREA CLINICS

	Primary	Secondary	Tertiary	Period not indicated	Gonorrhoea	Gonorrhoeal complications	Soft Chancre	Lympho-granuloma	Mixed Infectious Diseases	Investigation cases	Total
Chinese ..	27	46	10	34	73	26	42	11	10	109	388
Indian ..	7	8	2	8	13	..	11	4	1	17	71
Malay ..	6	9	4	7	18	2	6	5	1	18	76
Eurasian ..	..	..	..	..	..	..	..	..	1	1	2
European ..	15	20	6	13	77	18	31	2	3	146	331
Indonesian ..	4	3	4	2	9	2	3	..	..	4	31
Others ..	3	4	2	1	9	2	8	..	..	11	40
Total ..	62	90	28	65	199	50	101	22	16	306	939

INVESTIGATION CASES

Venereal Disease clinics throughout the world serve both as clearing houses as well as treatment centres for various allied complaints which appear to the patient to be of venereal origin but are not necessarily venereal diseases. In England and Wales in 1948 the total number of venereal disease cases was 48,168, while the number of non-venereal disease cases who sought treatment at venereal disease clinics was 83,897. Just as infant mortality or incidence of malaria in tropical countries is considered to be an index of good sanitation and public health activity in an area similarly the venereal disease control and propaganda index might be judged in future by the number of patients reporting at a venereal disease centre for investigation and diagnosed as non-venereal disease. A break down of such cases in Singapore may be of interest in disclosing the close relationship they bear to venereal disease. The largest group is composed of cases who either previously had had venereal disease or had recently exposed themselves and wanted to be assured of a clean bill of health. 6,456 non-venereal disease cases reported to the division during the year and no apology is made for the following analysis as it has not been attempted hitherto:—

Apprehensive group including antenatal and contact cases	...	2,802
Dermatological complaints	...	1,720
Arthritis and arthralgias	...	713
Non-conococcal urethritis, cervicitis, trichomonas infestation, dysuria, hæmaturia, etc.	...	654
Other genital infections—balanitis, warts, paraphimosis, traumatic, ulcers, hydrocele, non-specific epididymitis, and sexual complaints	...	344
Yaws	...	56
Leprosy	...	18
Non-conococcal ophthalmia and iritis	...	39
Adenitis	...	56
Cancer cervix, polyuria due to nephritis and diabetes and cardiovascular cases	...	54
Total	...	6,456

There is no doubt that these are legitimate complaints for investigation at a Social Hygiene Clinic, and a plea is made for the inclusion of dermatology in such a department as is done in many clinics elsewhere. The location of this hospital in the heart of the town is another factor to be considered in its favour.

TRAVELLING DISPENSARY

Since 25th November, 1950 a Social Hygiene Travelling Dispensary service has been inaugurated for the rural areas of Singapore and its programme has more or less been integrated with antenatal clinics of the rural health service of the Colony. The van has been fully equipped with the necessary materials required for examination, diagnosis and treatment of patients suffering from venereal disease. It is intended to serve the male population of the areas as well in 1951 when it is hoped to have an additional Medical Officer. The following table shows the areas visited and number of patients examined. The schedule has been made to fit the convenience and visits of the Lady Medical Officer of the rural health service who has taken a keen interest in the project :—

WOMEN AND CHILDREN ONLY

Period 25-11-50 to 31-12-50

Clinic	Number of new cases	Number of Ante Nats	Number of Positive cases	Total
<i>Central Rural</i>				
Upper Serangoon ..	Adults ..60	58	Syph. 1	64
Yio Chu Kang ..	Babies .. 2		Adult with pregnancy	
Lorong Tai Seng ..	Children .. 2		..	
<i>Rural West</i>				
Bukit Timah ..	Adults ..56	42	Syph. 4 .. 2 babies	66
	Babies .. 5		2 adults	
	Children .. 5		G. C. .. 2 adults with pregnancy ..	
<i>Seletar</i>	Adults ..38	36	..	38
	No babies or children			
<i>Rural East</i>				
Changi	Adults ..57	50	Syph. 2 .. 1 adult	63
Kampong Batak ..	Babies .. 3		1 baby	
Ulu Bedok ..	Children .. 3			
Siglap .. ..	.. ..	..	..	63
<i>Pasir Panjang</i>	Adults ..38	38	..	38
			Total ..	269

The main objectives of such a service have been to find new cases and administer prompt treatment, and to continue treatment of old cases most of whom are poor and cannot afford the necessary time or money to come for treatment.

Out of 224 antenatal cases examined in the rural areas only three or about 1.3 per cent have been diagnosed as syphilis. Next year's figures should

reveal the actual prevalence with more accuracy and detail. Out of 50,000 women examined in Newcastle-on-Tyneside in England only 0.9 per cent were so diagnosed.

TREATMENT

Gonorrhœa—It is interesting to note the variety of names given to this disease in different parts of the world. While the Malays refer to it as 'cold', the Indian calls it 'disease of heat' and tries to cure it by drinking bucketsful of buttermilk. It is 'clap' or a 'dose' or a 'strain' to the more sophisticated Westerner. But it was left to the Creoles of the West Indies and Central America to give it the self descriptive name of 'runnings', a bit better than the Chinese title of 'white flow or poison'.

Prior to the introduction of the sulpha drugs and later of penicillin its public health control was a failure in every country of the world both from the social and the medical points of view. The prospects look much brighter now.

In the male section all acute gonorrhœa is treated by 300,000 units of procain penicillin in oil with aluminium monostearate administered in one injection intramuscularly. Discharge generally stops between 24—72 hours after injection and dysuria and burning sensation a day or two later. Many patients keep on passing threads in the urine, some for nearly a fortnight or longer, but no gonococci have been found on examination. Once the discharge disappears it becomes very difficult to make these patients attend the clinic for further examination and tests for cure. In the dock area clinic 33 patients out of 823 relapsed one to three weeks after such treatment—a relapse rate of about 4 per cent. It is interesting to learn that a similar relapse rate has been noted elsewhere.

That re-infection is common is revealed by the following table from the same clinic:—

<i>Second attack</i>	<i>Third attack</i>	<i>Fourth attack</i>	<i>Fifth attack</i>	<i>Sixth attack</i>
157	72	33	23	12

It is possible that some of these may be cases of relapse only. It is taken as a re-infection when the patient has given a history of exposure and development of disease three to four days later.

The highest number of attacks in an individual has been thirty—a Chinese, whose wife was also found to be infected. Primary infection was contracted in 1948.

In the female section about 80 per cent of such cases have been admitted for in-patient treatment with 800,000 units of aqueous penicillin G and sulphathiazol for two days. A case was also found to be positive two days after procain penicillin in oil given in the out-patient department.

Chloromycetin—Smadel, Baily and Mankiker have reported from the Institute of Medical Research in Kuala Lumpur on the curative effect of chloromycetin in acute gonococcal infection with a single dose of 1—3.5 G by mouth with a relapse rate of 20 per cent within one month. Ten cases were so treated during the year in the male out-patient clinic here but were only given one capsule daily of 0.25 G of chloromycetin for one or two days. At least no relapse had been reported within one month of follow-up. The experiment was stopped as patients were getting curious to learn the name of the drug, and self administered treatment could be dangerous from the control point of view.

Non-Specific Urethritis—This appears to be the urethral discharge disease of the future. It is difficult for a clinician to diagnose this with scientific accuracy without the help of a well equipped laboratory. Both the Government Pathological and the Bacteriological departments of the University of Malaya have expressed their inability to carry out culture or other research connected with this disease at the moment. From the treatment point of view the response to streptomycin has been quite satisfactory. So far only thirty-one cases have been so diagnosed.

Syphilis—There has been no change in the treatment schedule. Penicillin, of course, remains the treatment of choice. The treatment followed by the clinics in Singapore today is what has been recommended by the World Health Organisation modified in the light of local practice. In primary sero-negative syphilis for example, in addition to 5 megaunits of penicillin, 5 mepharsen injections of 0.04 grams daily, and at least 10 weekly bismuth injections (0.2 grams metallic) are given. Due to the prolonged 'depot' action of bismuth this method serves to protect persons against re-infection for a considerable period after the last injection, a very necessary requisite in many of Singapore's cases. In congenital syphilis the penicillin dose recommended by the World Health Organisation (100,000 units per pound of body weight) has been found insufficient for local babies. At least two or three times the recommended dose is ultimately given.

The course of penicillin now takes ten to fourteen days instead of the previous seven and a half days as in many children and adults the initial few doses given have to be smaller than the standard dose because of the frequency of herxheimer reaction. This reaction means that a person gets a general and focal increase of symptoms, i.e. fever and marked predominance of primary, secondary or tertiary lesions.

Figures for clinical or serological relapse have not yet been analysed, but two cases of early syphilis relapsed within two months after a course of penicillin, arsenic and bismuth for ten weeks. For early secondary as well as neurosyphilis cases a more prolonged course of penicillin is given—10 to 15 megaunits in certain cases.

Granuloma Inguinale—Two cases were treated in the General Hospital. Both were in Europeans and most probably were imported cases. None has been reported from any of the Social Hygiene clinics.

Lymphogranuloma—Two female patients with esthiemene syndrome involving vulva (with ulceration and elephantiasis) and stricture of rectum were treated with aureomycin with satisfactory results. One patient had 106 capsules of 250 mg. each.

The attached table shows details of venereal disease treated and total attendances, with a classification of nationalities during the year 1950.

A study of the figures and tables included in this short report should make it abundantly clear that the steady advance in the number of cases coming up for treatment reported previously has continued into 1950. In fact this year can be stated to be an all time record in this respect. This is an excellent effort in view of the limited accommodation and small staff available.

Under the Medical Plan the present organisation will be more than doubled, but it is impossible to accommodate more in-patients at present. The two full-time and two part-time doctors available have their hands more than full in dealing with the present numbers. Under the Medical Plan the out-patient facilities

will be considerably improved and increased, while in-patient accommodation will rise from the present 60 beds to at least 120. It must be stressed again that comparative increases do not necessarily mean an increase in the incidence of the disease in Singapore, but to new methods of approach and treatment. These are bringing more and more patients forward. The time has come in fact when present arrangements are proving quite inadequate to meet the public demand in this direction. In the meantime in consequence more attention will be paid to evening clinics and to the travelling dispensary scheme arranged for the rural districts but on an experimental basis so far.

Within the limits of staff and accommodation available the venereal disease campaign in Singapore can be said to have met with a definite success. Far more is being done today to combat the disease than ever before. A tremendous amount remains to be done of course. It is still the contention that progress should be on the present lines—a scheme founded on persuasion and confidence between the patient and the doctor. Compulsory notification and segregation have been advocated again and again, but these ideas do not meet with favour by those who have to deal with the problem locally. Measures of force would mean the immediate destruction of the present scheme, and loss of confidence in the classes most concerned. Accommodation would have to be of a definite prison nature and would without doubt necessitate a very large staff. So a steady advance on present lines is advocated as far as the *medical* side of the problem is concerned.

The following extract from the 1949 *Ministry of Health Report* is relevant:—

It is still too early to say to what extent, if any, the fall in the number of new infections of both syphilis and gonorrhœa treated in the clinics is due to the almost universal use of penicillin or whether it is largely, if not entirely, consequent on the return of peacetime conditions. So simple is the modern treatment of gonorrhœa that it is possible that more cases of this disease are now treated by private practitioners than formerly but there is no evidence that this is the case with syphilis. It must not be forgotten, however, that in 1948 the clinic incidence of early syphilis was still more than twice what it was in 1939, but there will be every cause for satisfaction if the present rate of decline can be maintained or even approached during the next two years.

Procaine penicillin is being used to an increasing extent for the ambulant treatment of syphilis in all its stages and seems to be fulfilling its early promise as an effective agent for the treatment of early infections. Excellent results from its use are also being obtained in prenatal and congenital cases as well as many of the manifestations of late syphilis (including neurosyphilis). Though it is still impossible to know whether the ultimate results of penicillin in late syphilis will excel or even equal those attained in the past with arsenicals and bismuth, many workers are making use of it to an increasing extent, either alone or in combination with reduced amounts of these time honoured drugs.

Social Work

There is a growing appreciation of the fact that no clinic can be considered complete without its 'social side'. The venereal diseases are social diseases par excellence and the services of a trained social worker should be at the disposal of every doctor engaged in their treatment. Thus only can the difficulties which beset so many patients be resolved and the ever present tendency to default corrected. An increasing interest is being taken in the problem of contact tracing and the help of the social workers on the staffs of medical officers of health is appreciated. Their assistance is particularly useful when the contact is at a distance or the patient otherwise unable or unwilling to co-operate. It is, however, the opinion of many clinic doctors that the patient, properly handled, is often the most effective contact tracer. Much infection is spread by the persistently promiscuous, who too often can give but a vague geographical clue to the resort of their contacts and none as to their identity. This is particularly so in the case of the patient with syphilis, whose short memory is not helped by the long incubation period. Painstaking efforts on the part of both doctor and social worker will sometimes secure a contact on the flimsiest of evidence, but in great cities such consorts are often impossible to trace.

SOCIAL HYGIENE BRANCH, SINGAPORE

TABLE SHOWING TYPE OF VENEREAL DISEASE, MALE AND FEMALE PATIENTS, TREATED AT THE MIDDLE ROAD HOSPITAL
AND TANJONG PAGAR CLINIC DURING 1950

	IN-PATIENTS			OUT-PATIENTS			OUT-PATIENTS			OUT-PATIENTS					
				NEW CASES			REPEATITIONS			TOTAL ATTENDANCES					
	NEW CASES			HOSPITAL			DOCK CLINIC			HOSPITAL			DOCK CLINIC		
	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total
Syphilis															
	30	63	93	462	50	819	3,294	802	7,808	3,756	852	4,019	8,627		
	97	152	249	701	112	1,046	18,775	1,962	26,344	19,476	2,074	5,840	27,390		
	82	108	190	211	53	306	3,231	1,282	5,155	3,442	1,335	684	5,461		
	6	179	185	8	153	161	98	2,122	2,229	106	2,275	9	2,390		
Period not indicated	39	574	613	308	418	805	2,145	8,589	11,362	2,453	9,007	707	12,167		
Other Venereal Diseases															
Gonorrhoea	5	312	317	2,000	386	3,209	7,344	414	11,949	9,344	800	5,014	15,158		
Gonorrheal Complications	53	30	83	93	44	192	744	9	1,391	837	53	693	1,583		
Gonorrhoea Ophthalmia	..	97	97	..	86	86	..	11	11	..	97	..	97		
Soft Chancere	23	3	26	1,012	16	1,474	5,505	13	9,163	6,157	29	4,091	10,637		
Lymphogranuloma	13	15	28	140	13	223	655	10	1,289	795	23	694	1,512		
Mixed Infections	27	38	65	261	16	472	920	152	1,974	1,181	168	1,097	2,446		
Investigation Cases (non V.D.)	65	544	609	2,898	2,537	6,456	3,510	6,588	11,668	6,408	9,125	2,591	18,124		
Total	440	2,115	2,555	8,094	3,884	15,249	46,221	21,954	90,343	54,315	25,838	25,439	105,592		

OUT-PATIENTS

NEW CASES

					Males	Females	Total
Chinese	..	..	..	..	6,535	3,021	9,556
Indian	..	..	..	..	3,229	351	3,580
Malayasian	..	..	..	..	996	455	1,451
Euraisan	..	..	..	..	76	27	103
European	..	..	..	..	387	..	387
Others	..	..	..	..	142	30	172
TOTAL ..					11,365	3,884	15,249

OUT-PATIENTS

REPETITIONS

					Males	Females	Total
Chinese	..	..	..	..	40,621	17,236	57,857
Indian	..	..	..	..	20,285	1,586	21,871
Malayasian	..	..	..	..	5,693	2,603	8,296
Eurasian	..	..	..	..	463	291	754
European	..	..	..	..	835	..	835
Others	..	..	..	..	492	238	730
TOTAL ..					68,389	21,954	90,343

CHAPTER TWENTY-ONE

MATERNITY AND GYNAECOLOGY

KANDANG KERBAU HOSPITAL

KANDANG KERBAU HOSPITAL continued as the main centre for all Government maternity and gynaecological work in the Colony. Although the bed strength remained at the same level, that is some 240 beds, the number of hospital births averaged over 1,000 per month—an all time record—and the labour wards were so overcrowded that it sometimes became necessary to deliver patients on trolleys. To ease the overcrowding the length of stay of each patient in uncomplicated cases was curtailed to three days.

During 1950 admissions totalled 14,197 with 13,238 deliveries, as against 12,678 admissions and 10,928 deliveries in 1949. The maternal death rate was 4.8 per 1,000 as against 5.1 for 1949.

The percentage of maternal deaths to total deliveries has shown a steady reduction over the post-war years, as is seen from the following figures, in spite of the adverse conditions from overcrowding and shortage of trained staff:—

1947	...	...	...	...	...	0.92 per cent
1948	...	...	...	...	...	0.62 per cent
1949	...	...	...	...	...	0.51 per cent
1950	...	...	...	...	...	0.46 per cent

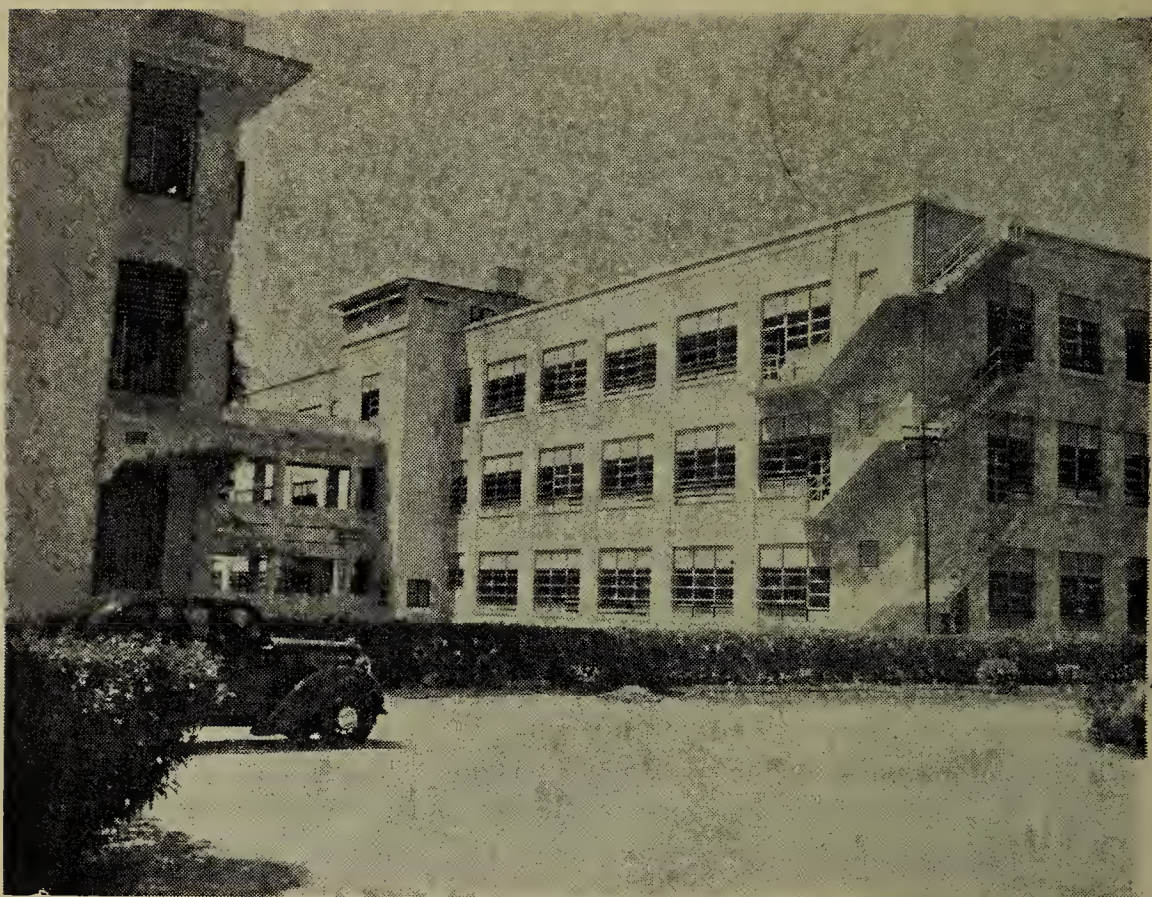
This is a satisfactory position when it is noted that all abnormal and difficult cases find their way to this hospital from a population of over one million and that many women only arrive when labour is far advanced or even after labour.

Abnormal deliveries dealt with have also decreased considerably over the post-war period—a very satisfactory feature:—1,285 cases came into hospital in 1950 compared with 1,293 in 1949. Of these 1,285, 2 died.

Cases numbering 2,494 were admitted to the gynaecological wards as compared with 2,101 in 1949, and 2,525 were operated upon (438 of these being treated as out-patients) some returning to their homes the same day.

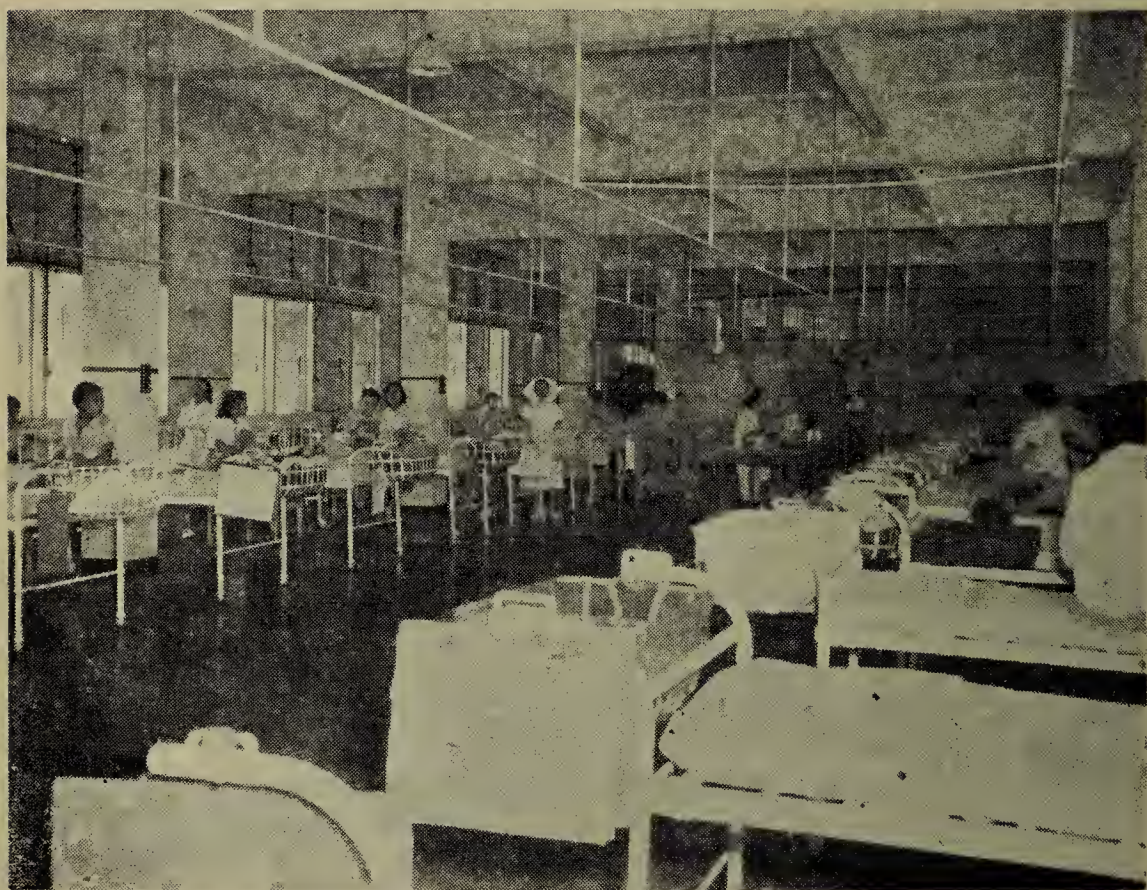
There has been an interesting increase in the number of Caesarean operations over the post-war period—133 such operations in 1950 with only 20 to 30 in 1947 and previous years, about half of which were for placenta praevia. 75 cases were delivered with forceps; 429 breech presentations were seen. Premature births numbered 230 and still births numbered 444. There were 14,197 admissions in all to the maternity division during the year compared with 12,678 in 1949.

Kandang Kerbau Hospital is now a free institution except for a small paying block where patients can be dealt with by their own practitioners. This system is a necessity in Singapore where private maternity homes cover only a negligible number of beds. With the facilities provided by this hospital, by the rural Government maternity service and by the Municipal maternity service, 52 per cent of all births in the Colony are now controlled. The hospital dealt with 28.5 per cent of the total births. The rural service covered 64.2 per cent of the births in the rural districts.



Public Relations

Kandang Kerbau Maternity Hospital



Public Relations

Kandang Kerbau Maternity Hospital

The following conclusions can be drawn from present experience:—

(a) the disappearance of any fear of hospitalisation by the women of the Colony and a steady increasing demand for both in-patient and out-patient treatment. In 1919 only 232 patients sought maternity care: 1,606 in 1929: 6,034 in 1939, 12,678 in 1949 and 14,197 in 1950. An institution designed for 240 in-patients on a ten day stay and a small antenatal division only, and staff quarters accordingly, can only reach the present record figures with a serious danger of exhaustion and loss of efficiency. The present aim is still to admit all who seek admission on the assumption that some aid is better than none;

(b) the rapidly increasing desire for ante and post-natal supervision—a most satisfactory feature which must be met by increased facilities at the earliest possible moment. It is no use having health propaganda without the means to meet it. This is leading to—

- (1) the continued reduction in the maternal mortality figure;
- (2) the increase in the number of abnormal cases seeking early admission; the increase in the number requiring Caesarean operation;
- (3) the disappearance of destructive operations on the child (decapitation, etc.);
- (4) the low forceps delivery figure;
- (5) the reduction in eclampsia;
- (6) the reduction in transverse presentations.

Footnote:—Professor English who was for many years Professor of Midwifery and Gynaecology in Singapore has recorded the following hospital deliveries over the years:—

1915 ...	175	1932 ...	2,146
1916 ...	195	1933 ...	2,306
1917 ...	206	1934 ...	2,575
1918 ...	221	1935 ...	3,548
1919 ...	232	1936 ...	4,707
1920 ...	342	1937 ...	5,214
1921 ...	496	1938 ...	5,551
1922 ...	466	1939 ...	6,034
1923 ...	797	1940 ...	6,184
1924 ...	688 (moved to new site)	1941 ...	6,425 (only 300 in December)
1925 ...	588	1942 ...	1,913
1926 ...	753	1943 ...	2,037
1927 ...	1,019	1944 ...	1,657
1928 ...	1,304	1945 ...	1,584
1929 ...	1,606	1946 ...	5,101
1930 ...	1,882	1947 ...	7,802
1931 ...	1,955		

Since then the statistics read as follows:—

1948 ...	10,272	1950 ...	13,238
1949 ...	10,928		

OUT-PATIENT CLINICS

In addition to antenatal, post-natal and gynaecological clinics, there is a clinic for women and children where medical assistance and advice on general ills may be obtained. All these clinics dealt with a considerably increased number of patients and are becoming widely appreciated amongst the indigent population. Almost 8,000 examinations of babies were carried out in the post-natal clinic. The following table gives some indication of the present out-patient provision at this hospital.

It will be seen that new cases increased from 29,000 to some 50,000, a most important step forward in 1950.

Clinic	1949		1950	
	New Cases	Total Attendances	New Cases	Total Attendances
Antenatal and Gynaecological	12,665	37,010	19,256	34,837
Post-natal (mothers) } (infants) }	.. ..	6,931	6,287 6,044	8,149 7,802
Women and Children ..	16,333	49,139	19,032	56,044
Total ..	28,998	93,080	50,619	106,832

Routine laboratory examinations numbered 29,364 as against 27,794 the previous year.

All returns for December were influenced by the riots which kept many people from attending the various centres.

The Medical Plan seeks to more than double the facilities available both in the Maternity and the Gynaecological sections, and to establish a really up to date series of out-patient divisions covering the various aspects of ante and post-natal activities now being attempted. The above figures in the present very limited and outmoded accommodation surely stress the urgent need for these steps without further elaboration. The sooner they are implemented in part or in whole the better for the future health of the community. For such an area as Singapore with a high proportion of the population living in inferior accommodation, it is extremely difficult for a maternity service to function really efficiently. In consequence the Maternity Hospital must of necessity take an ever increasing proportion of the 'labour' developing. That so much is being done with so little in this respect in Singapore is one of the 'miracles' of our post-war period.

The important Central Midwives Board continued its periodic meetings to deal with the many aspects of the training of midwives and to exercise its

control over the work of the midwives in practice already. During the latter part of the year it drafted an up to date revised Midwives Ordinance introducing and covering a new scheme of training based on that in the United Kingdom.

This new Ordinance will have the effect of requiring a trained nurse to do a one year midwifery training, and pupil midwives to do two years for a certificate equivalent to that in the United Kingdom, instead of the present one year course for all.

A new Ordinance for the Registration of Nursing Homes and Maternity Homes was also drafted.

As highly qualified midwives must take more and more of the work previously undertaken by nurses, the new training and all to do with it is a most important factor of the immediate future.

Medical Superintendent: Dr. W. A. Balhetchet, O.B.E., L.M.S. (S'pore).

Professor of Gynaecology and Obstetrics: Professor B. H. Sheares, L.M.S. (S'pore) M.R.C.O.G. (Lond.).

Gynaecologist and Obstetrician: Dr. (Miss) E. V. Crowe, M.B., CH.B., F.R.C.S. (Edin.).

CHAPTER TWENTY-TWO

LEPROSY

THE first step in the implementation of the Medical Plan took the form of additions to the Leper Settlement, now known as Trafalgar Home. By mid year 28 new semi-detached quarters had been completed. Each quarter has two separate rooms accommodating two persons. Thus 112 patients have been allocated new housing and literally given a fresh start in life. Each room is furnished with two cupboards, two bedside stools, two bedside lockers and two beds complete with linen. The erection of these quarters has entirely changed the previously untidy, dilapidated appearance of the camp. Morale has improved tremendously in consequence as previously some 450 patients were housed in a building designed for half that number. Added to this is the inspiration and example given by the two nuns of the religious order of the Franciscan Missionaire of the Divine Motherhood who are now responsible for part of the nursing, the standard of which has improved to such an extent as to compare more favourably with that of our other hospitals.

The total bed strength on 31st December, 1950 in Trafalgar Home was 550—an increase of 99 over the year—the allocation being as follows:—

					<i>Male</i>	<i>Female</i>	<i>Total</i>
Adults	...	...	...	...	310	161	471
Children	...	...	...	...	47	32	79
					<hr/> 357	<hr/> 193	<hr/> 550

During the year it became necessary to transfer a further 40 patients to Pulau Jerejak in the Federation until such time as they can be accommodated here. There were 12 deaths and 37 patients were discharged as cured.

Plans were in process of completion for the much needed second stage of the Medical Plan, and this will be pressed ahead in view of the apparent and steady increase in admissions and the continued serious overcrowding which prevails particularly in the female section.

TREATMENT

The following is a resume of the treatment carried out:—

Total number of patients	...	...	...	...	550
Total number of patients on Sulphone in oil	...	...	...	...	417
Total number of patients on Sulphetrone tablets	...	...	...	...	50
Total number of patients on Injection of Sulphetrone in water	...	...	...	...	48
Total number of patients on Diasone Tablets	...	...	...	...	1
Total number of patients on Injection Hydnocarpus Oil	...	...	...	...	2
Total number of patients with no specified treatment	...	...	...	...	32

Simple sulphone in oil, given as injections, has maintained its early promise and is tolerated far better than oral sulphetrone in the majority of cases. When treatment with sulphone, made up in arachis oil, was first started on a large scale in October last year a severe reaction occurred in several cases. Later sulphone made up in refined coconut oil was obtained, and the incidence of

nose bleeding was immediately reduced while reactions with eye involvement are now very much less frequent. Sulphone injections averaging 2 c.c. twice weekly are fairly well tolerated by patients and in many cases the maximum dose of 2.5 c.c. twice weekly can be given without untoward symptoms. It is easier to obtain maximum dosage with sulphone than with sulphetrone on account of the latter's effect on the blood. One real therapeutic advantage is that it does not cause a rapid deterioration of the blood picture—in fact it is noticed so far that all cases intolerant to sulphetrone showed a rise in the haemoglobin concentration within two weeks of stopping sulphetrone and continuing the treatment with sulphone. There are a number of cases who are doing well on sulphetrone still however, with iron and vitamin therapy given as a routine. It has also been noted that sulphone produces a marked and fairly quick improvement clinically, but smears from affected areas remain positive to acid fast bacilli for a considerable time, in spite of obvious clinical healing. This is more often the case with the lepromatous type of lesion.

It has been suggested that a solution of sulphetrone in water when given by injection is far less toxic than either sulphetrone by mouth or sulphone by injection, and that a much smaller amount of the drug is necessary for effective treatment. Certain selected cases have already been placed on this form of treatment and more will be given, or if they prove intolerant to sulphone.

There are a smaller number of cases receiving no specific treatment for various reasons, e.g. cases of pronounced and resistant anaemia, cases of heart and kidney disease, cases in a state of almost permanent reaction, etc. These are being treated on general lines only at present. Advanced lepromatous cases of several years duration are still being admitted to the Home. It is these that are so difficult to treat as the general condition has deteriorated to such an extent that they are almost bedridden. There is usually a pronounced anaemia, pernicious or of toxic origin due to chronic bacterial or helmenthic infection. Treatment for the leprosy in these cases has to be delayed for some time until the general condition improves.

As from February 1950, weekly Out-patient Departments operated at the Tan Tock Seng and General Hospitals where patients discharged as cured continued observation and treatment. At present there are 79 patients on this Out-patient Register, of whom 32 are discharges from Trafalgar Home. A further 15 were awaiting discharge at the end of the year.

Rehabilitation of discharged lepers is the problem which requires early solution. Inmates who have been discharged find it very difficult to settle down to a non-institutional life after so many years or to get employment if they bear any obvious stigmata of the disease. Various degrees of disability resulting from the disease alone make it difficult for the unfortunates concerned to carry out their original type of work. Here is where a physiotherapist comes into the picture as in so many other sections of our work today.

Occupational Therapy

An occupational therapist from the General Hospital carried on till the end of October in teaching the patients once a week for two hours in making toys, baskets, scarfs, embroidery, knitting and so on. These patients have shown great response to this help and the departure of the lady concerned, with the closing down of her section, has been a severe loss and not only to our lepers.

Vocational Training

Nineteen boy apprentices are now doing carpentry, brick laying, plumbing, electrical repairs, furniture making, painting, etc. under inmates who have knowledge of these subjects, and there is scope for more in this way if instructors can be obtained. Repairs to furniture and light equipment which normally are sent elsewhere are now being done on the spot. Many of the boys have attained a good knowledge of the trade and are ready to make it a means of livelihood when discharged.

Scouting and Guiding

There are thirty-three boys in the Scout Troop. The Scout Master is the Hospital Assistant in Charge and he is helped by two assistants who come from the Royal Air Force, Seletar.

Hikings are arranged monthly and are followed by a camp-fire party. Owing to the obvious social problems the boys are unable to attend camps and competitions held among other troops in the Colony.

A Guide Company with thirty-four girls also flourishes under the leadership of the Almoner from the General Hospital. Weekly meetings are held, songs and games are taught, and trackings and outings to the seaside are arranged once a month, followed by a camp-fire.

Schools

There are at present forty boys and thirty-five girls between the ages of five and fifteen. There are four inmate teachers of Standards IV, VII, VIII, and one with the Senior Cambridge Certificate. So the teaching of elementary English, reading, writing, wall picture, conversation, with physical training and handicraft up to Standard II has been a feature over the past year. On the retirement, owing to failing sight, of Miss Buxton, M.B.E., who used to supervise the school, a lady supervisor is being sought to direct the teachers and children. The higher class for Standards IV and V, with seven girls and three boys, studies English, mathematics, hygiene, elementary physiology, anatomy and general knowledge under Mr. Champion, a regular teacher attached to St. Andrew's School, sent out by the Education Department. Monthly tests and quarterly examinations are held. Results achieved by the pupils are of a very high standard, comparable with any school in the Colony. The Cambridge Certificate girl takes the inmate nurses and dressers in elementary nursing, and in anatomy and physiology.

The Leper Welfare Committee

The Leper Welfare Committee under the vigorous guidance of Canon Adams continued to do its good work. Homes are found on a non-legal adoption basis for children in the Settlement and pocket money of \$2 is still continuing to be paid to the children once a month. During Chinese New Year special additional diet was provided, and occasional picture shows have been arranged by the Franciscan Order of the Divine Motherhood.

It is hoped that the not too distant future will show an increased discharge rate as the result of modern treatment. However there has been an average entry of some fifteen per month. While this flow of new cases may be in the nature of a temporary abnormality there is no question that the disease seems to be more prevalent today than before the war. Presumably the neglect of the Japanese Occupation years can be held responsible in part at any rate

for this phenomenon. A large proportion of present and future inmates of the Singapore institution have little hope of ever leading a non-institutional life. Many are not seen until the disease is so far advanced that a grave deformity must result, and the later the treatment the more difficult the cure. With improved prospects of cure brought about by the use of the new drugs and the consequent abolition of the stigmata associated with leprosy, it is hoped that earlier treatment will be sought and so lead eventually to considerably increased out-patient care as compared with the in-patient. Discharge, however, is proving very difficult today. Those who have left often demand re-admission: they cannot face the outside world again. This is a problem which will have to be faced on an increasing scale in a community which fears this disease and treats its sufferers as outcasts whatever is said to the contrary.

All these factors have had to be considered in drawing up a long range policy. The accepted Plan is thought to be a suitable compromise to a difficult and perplexing problem.

A large part of the land surrounding the settlement is farmed by the inmates. This gives many of them the occupation which is so essential in such a community. Pigs and poultry are reared and a variety of vegetables and flowers are grown. Individual farmers sell their produce to inmate contractors who in turn deal with Government at contract rates for feeding the inmates of the Settlement itself and the Mental Hospital. In addition 158 other lepers are employed in the settlement in paid posts such as tailors, cooks, carpenters, bakers and sweepers.

The gates of the settlement are now left permanently open and every effort is made to dispel the feeling of internment or imprisonment. All the glass and barbed wire which was placed on top of the surrounding walls has been removed and the walls painted in attractive colours. Creepers are being placed inside the walls to increase the garden effect.

DIET

The diet of the inmates of Trafalgar Home has received very considerable attention during the year. The total cost now approximates one dollar per day per individual and over for those on a supplementary diet. Farm workers added considerably to this fare from their own produce. The diet of the institution has received added attention because of the very important part it plays in treatment in a disease with a very prolonged course. The drugs now in use also demand a reasonably healthy physique.

SPECIMEN DIET PER PATIENT PER DIEM

						1950	
						Ounces	Cents
Pork	...	...	...	...	...	4	20½
Fish	...	...	...	...	...	4	11½
Vegetables	...	...	...	...	...	6	4
Rice	...	...	...	...	...	10	11
Sugar	...	...	...	...	...	1	2
Bread	...	...	...	...	...	2	3
Butter	...	...	...	...	...	$\frac{1}{3}$	18
Fruit	...	...	...	...	...	4	12
Coffee	...	...	...	...	...	$\frac{1}{2}$	3½
Salt	...	...	...	...	...	$\frac{1}{2}$	½
Other ingredients	...	...	...	...	...	—	8½

The Singapore Cold Storage Company very generously supplies every patient with free ice-cream every month, a gesture which is very greatly appreciated.

The manner of food preparation in the Settlement leaves much to be desired because the present kitchens are inadequate and antiquated. There are no separate rooms for storage, or preparation, or for dining purposes. These are matters which are receiving attention under the extension plan which is being started. All that can be done with the present feeding arrangements is to see that these are as clean as possible. The cooks themselves are inmates of course.

So far it has not been possible to discharge a large number of cases as cured but an improvement in this respect is expected in Singapore in the not too distant future. It is to be noted that there has been no shortage of drugs and no patient has failed to receive the treatment prescribed on this account.

Action was taken during the year to buy instruments and other new equipment. In the past there has been a definite tendency to pass an old and dilapidated equipment to the Leper Settlement, but this solution can no longer be tolerated in view of the modern procedures which must take place.

Medical Officer-in-Charge: Dr. A. L. Greenway, M.B.E., M.R.C.S., L.R.C.P.

Medical Officer: Dr. R. S. Corbitt, M.B.B.S. (Madras).

Towards the end of the year Dr. Grove-White who has always taken a keen interest in our lepers supervised the clinical arrangements on his return from leave.

CHAPTER TWENTY-THREE

OTHER SPECIAL DEPARTMENTS

DIVISION OF RADIOLOGY

THE Division of Radiology in the Singapore hospitals comprises:—

- (1) a general diagnostic service at the General Hospital, which deals with the cases for radiological diagnosis from the wards and large general and special out-patient departments of the General Hospital itself, from the obstetrical and gynæcological units at Kandang Kerbau Hospital, from the Orthopædic Hospital at Siglap, and from the Special Hospital at Middle Road;
- (2) a diagnostic unit at Tan Tock Seng Hospital for the tuberculosis in-patient and out-patient services there. This is combined with a mass miniature unit for chest survey work;
- (3) a radio therapeutic unit at the General Hospital.

It is proposed to consider these units under separate headings, but it is to be noted that, in the two diagnostic sections, a total number of 45,738 radiographic examinations was carried out during 1950, as compared with 34,069 in 1949, 21,562 in 1948, 17,562 in 1947, and only 6,000 in 1938. In addition, 6,635 fluoroscopic examinations were done at the diagnostic unit at Tan Tock Seng Hospital, so that the total number of radiographic and fluoroscopic examinations for 1950 is 52,363.

The steady annual increase in the number of cases referred to the general diagnostic unit at the General Hospital has been maintained—29,210 in 1950 as compared to 26,975 in 1949, but the very large increase in the total volume of work is accounted for by the expansion of the tuberculosis service, both diagnostic and therapeutic, in the wards and in the Rotary Clinic at Tan Tock Seng Hospital.

DIAGNOSTIC SECTION, GENERAL HOSPITAL

In this section, 29,210 cases were dealt with, as compared to 26,978 in 1949. The details of these cases are shown in the following table:—

Lungs	...	...	...	...	...	17,129
Bronchography	...	...	...	...	...	89
Heart	...	...	...	...	...	401
Bones (Injury)	...	...	...	...	...	4,578
Bones (Pathology)	...	...	...	...	...	3,612
Gastro-Intestinal Tract	...	...	...	...	...	1,011
Renal Tract	...	...	...	...	...	647
Gall-Bladder	...	...	...	...	...	295
Pregnancy	...	...	...	...	...	398
Salphingraphy	...	...	...	...	...	5
Encephalography	...	...	...	...	...	220
Paranasal Sinuses	...	...	...	...	...	587
Teeth	...	...	...	...	...	42
Others	...	...	...	...	...	196
Total						29,210
Average per month						2,434

Accommodation—It is recognised that this section which deals with all the general medical and surgical diagnostic work from the Singapore hospitals is too small for the amount and variety of work being done in it. This has been provided for in the Medical Plan, the implementation of which will make available for the diagnostic and therapeutic X-ray sections at the General Hospital the whole of the block of buildings of which they at present occupy less than half. Internal reconstruction of this block will make possible the provision of a properly-designed diagnostic and therapeutic section, with more examination-rooms, a modern dark-room, and adequate waiting-room accommodation and office space.

Equipment—The acquisition of new equipment has proceeded steadily in the five years which have elapsed since the hospital re-opened in 1946, at which time there was no functioning diagnostic or therapeutic apparatus at all.

The volume of work with which the diagnostic section is now called upon to deal requires more modern diagnostic apparatus, more space in which to house it, and more technical staff to operate it, but any further considerable progress in these respects will have to await progress with the Medical Plan as a whole.

Staff

(i) *Radiologists*—There are now three full-time radiologists in the Singapore hospitals, as compared with one in 1946–1947, and it is hoped to obtain the services of a local graduate for preliminary training during 1951.

(ii) *Radiographers*—There were no qualified radiographers in the Singapore hospitals until 1946. There are now posts for three, and these have at times been filled, but the wastage rate among female expatriate technical staff through marriage is high, and replacements are increasingly difficult to obtain, owing to the expanding demand for this type of technician in Britain. The employment of married expatriate women on a temporary basis proves an unsatisfactory expedient.

A number of locally-born pupils, recruited mostly from the ranks of Hospital Assistants, have shown aptitude for the work, and now form an indispensable part of the technical staff.

As it is not possible to provide in Singapore the necessary systematic instruction leading to a recognised qualification in radiography, steps are being taken to send suitable locally-born officers to Britain for a course of instruction leading to the examination for the Diploma of Membership of the Society of Radiographers (M.S.R.), and the first of these officers is to proceed overseas during 1951. It is to locally-born personnel that we must look for our future technical staff in the radiological department.

It will also be necessary to provide a separate diagnostic X-ray unit, with the accompanying staff, at Kandang Kerbau Hospital, to deal with the increasing volume of work from the obstetric and gynaecological units there. Proposals to this end are now under active consideration.

GENERAL CHEST AND MASS MINIATURE UNIT, ROTARY CLINIC, TAN TOCK SENG HOSPITAL

There has been a very large increase in the work done in this section. The total number of radiographic examinations during 1950 was 19,518, as compared to 8,139 in 1949. In addition to this, 6,635 fluoroscopic examinations

have been made during the year, mainly in cases undergoing treatment either by artificial pneumothorax or by pneumoperitoneum.

The work done during the year is shown below in tabular form:—

Miniature film examinations	...	...	...	3,589
Standard film examinations	...	...	...	12,929
Total radiographic examinations	...	...	...	16,518
Fluoroscopic examinations	...	...	...	6,635
Total Radiographic and Fluoroscopic examinations	...	...	...	23,153

Tuberculosis Survey Work

(i) *General*—The radiological survey of the lungs of certain Government department staffs, designed to furnish information regarding the incidence of tuberculosis in this section of the population, and originally commenced in 1949, continued during 1950, and is discussed under the heading of tuberculosis.

(ii) *Contacts*—Only a small percentage of the contacts of known cases of active tuberculosis took advantage of the advice given by health visitors that they should attend for X-ray examination.

Accommodation and Equipment

The great increase in the amount of tuberculosis work being done both in the hospital at Tan Tock Seng, and in the diagnostic and therapeutic Rotary Clinic attached to it, has rendered both the X-ray equipment and the accommodation of the X-ray section inadequate.

The combination of a mass miniature unit for survey work with a unit for general chest radiography, while perhaps practicable where the total amount of work is small, is not so in a busy therapeutic department like the tuberculosis unit at Tan Tock Seng Hospital.

It is proposed, therefore, as soon as the necessary arrangements can be made, to transfer the mass miniature unit to separate accommodation, and to provide the Rotary Clinic with the modern high-powered X-ray apparatus which is necessary in a large tuberculosis therapeutic centre.

RADIO-THERAPEUTIC UNIT, GENERAL HOSPITAL

During 1950, 126 patients have been treated in this section, the main types of case being shown in the table below:—

Post-nasal carcinoma (Lympho-epithelioma)	...	...	...	34
Carcinoma breast	...	...	...	16
Lymphadenoma	...	...	...	3
Leukæmima	...	...	...	3
Carcinoma larynx	...	...	...	5
Carcinoma antrum	...	...	...	4
Carcinoma tonsil	...	...	...	2
Carcinoma bronchus	...	...	...	2
Other malignant conditions	...	...	...	34
Keloids	...	...	...	4
Other non-malignant conditions	...	...	...	19
Total	...	...	...	126

Gynaecological malignancies are dealt with in the Gynaecological Unit at Kandang Kerbau Hospital.

Accommodation, Equipment and Staff

What has been said in regard to the diagnostic sections under these heads applies equally to the therapy section.

This section is at the moment only a nucleus, and it can deal with only a small fraction of the patients who would benefit from this type of treatment. To make an X-ray therapy unit capable of dealing with any considerable proportion of the cases would require the provision of much more apparatus. In addition, the provision of the necessary trained technical staff to operate the apparatus is a problem even more difficult than in the diagnostic section.

A proposal was made shortly after the end of the war for the establishment of a separate Department of Radio-therapy, but this was not then proceeded with in view of the urgent necessity of first providing basic medical and surgical services for the population.

The separation of the departments of diagnostic and therapeutic radiology is the normal practice in all large centres of population in Britain and America generally, and it would appear that the time is now ripe for the re-consideration of this project in Malaya.

Head of Division: Dr. J. W. Winchester, M.D., D.M.R.E.

PHYSIOTHERAPY

Three separate physiotherapy sections functioned during the year—medical physiotherapy, surgical physiotherapy and occupational therapy.

(a) Medical physiotherapy provides such treatment as short-wave diathermy, infra-red ray, galvanism and faradism, mercury vapour and ultra-violet ray. The total number of attendances for the year 1950 amounted to 17,037 as compared with 14,390 in 1949.

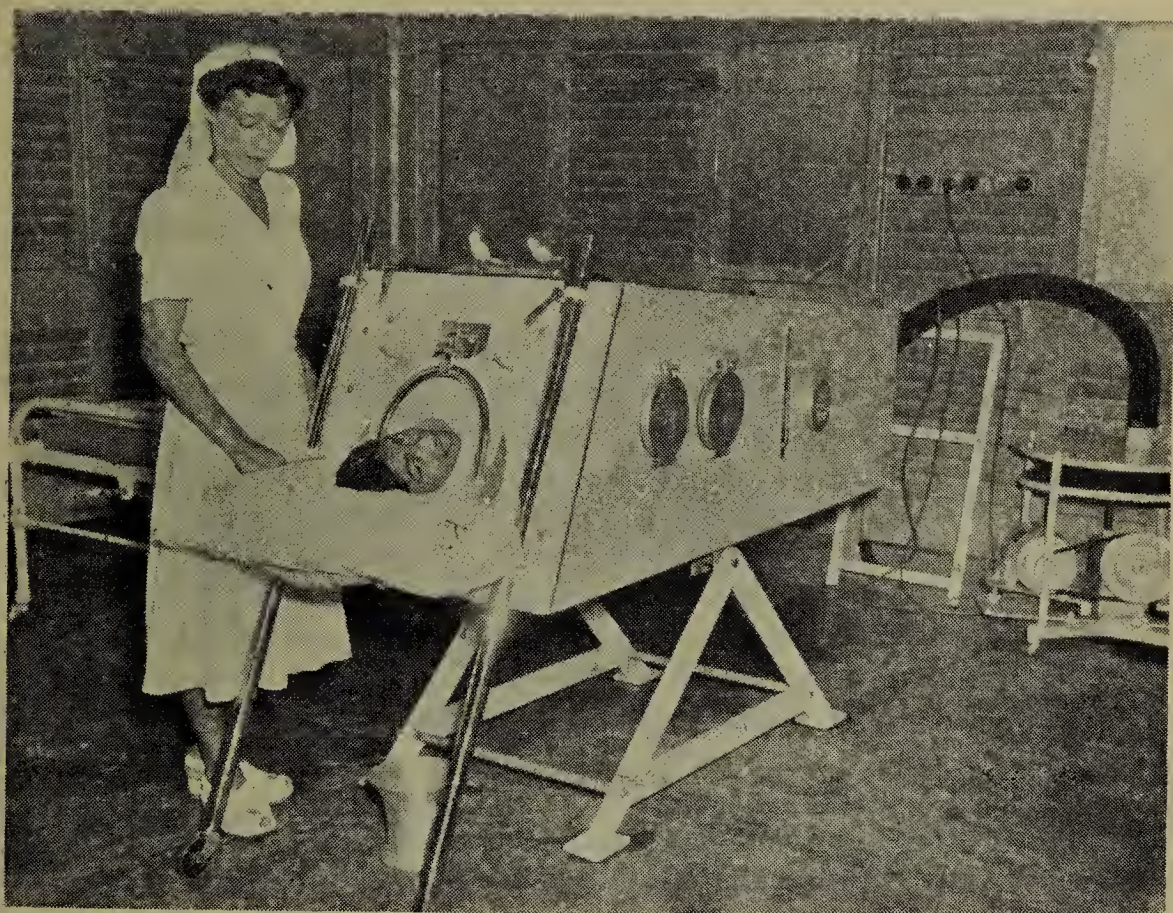
(b) The very important surgical physiotherapy division is attached to one of the surgical units and has shown an increase of some 30 per cent on all treatments given. In addition to the routine work undertaken in this section one member of the staff attended the Children's Orthopædic Hospital at Siglap three mornings per week in order to deal with the treatment of a number of old cases of poliomyelitis. As a result of the rapid increase in the number of cases of this disease towards the end of the year special and prolonged attention had to be given to the Middleton Infectious Diseases Hospital where acute sufferers were kept. As an orthopædic problem there is a phase during this illness when physiotherapy represents the major treatment required and this phase lasts for not less than two years. During the past few years there has been a continual succession of new cases, and as all cases must remain under supervision a poliomyelitis register has been opened. Not only will this record ensure that children are called up regularly, but should it become desirable to submit them to orthopædic intervention such will be recommended at the optimum time.

One of the important developments during the past year has been the increase in the amount of thoracic work, and the physiotherapist plays an important part in the pre-operative and post-operative care of these patients. The class for thoracoplasty cases at Tan Tock Seng Hospital has been resumed, and fracture follow-up clinics at the General Hospital have now become an established practice.



Post Polio Treatment

Public Relations



Iron Lung

Public Relations

The following figures indicate the nature of the work carried out under these heads:—

	1950
Number of ward cases	26,500
Number of out-patients	6,288
Number of poliomyelitis cases	2,528
Number in physical training and spinal remedial class ...	696
Number in Tan Tock Seng Hospital	80
Total ...	36,092

(c) Occupational therapy may be described as a division of surgical physiotherapy. Total remedial treatments numbered 3,610. In addition diversional work in the wards to the extent of some 400 patients was undertaken, but this is described under 'Voluntary Organisations and Assistance' elsewhere in this report. Unfortunately the one trained therapist available left the department during the year. In consequence the section had to close down.

Too much stress on the importance of physiotherapy in a modern hospital cannot be made. Without this form of treatment many patients would have to be retained in hospital for very much longer periods than is now the case, and they would be discharged in a condition which would make them a grave and added burden on the welfare services of the Colony. Many who previously remained as permanent cripples have now become useful citizens again. This applies particularly to post-poliomyelitis cases. This is a new service to Singapore and one of outstanding importance to the public. It will have to be steadily expanded in consequence.

Considerable difficulty has been experienced in the maintenance of electrical equipment. Servicing often means prolonged waiting for repairs to machines, and replacements are difficult.

INFECTIOUS DISEASE

Middleton Hospital, the infectious disease hospital with 250 beds, treated 1,795 cases of infectious disease during the year 1950 as compared with 1,678 in 1949.

There was no case of plague, cholera or small-pox, but 88 cases of enteric fever, two cases of scrub typhus, one case of urban typhus, 257 cases of diphtheria, 51 cases of measles, and 81 cases of poliomyelitis were recorded.

Enteric Group of Fevers—88 cases were admitted during the year and with three cases remaining at the end of 1949 a total of 91 cases were treated; of these five died. The disease broke out in mild epidemic form in February and March, 28 cases and 23 cases respectively being admitted during these months. At other periods the cases were spread out in twos and threes a month. A little more than 40 cases of the severe type were treated with chloromycetin with very gratifying results, hastening convalescence, and reducing risk of complications. It is not unreasonable to attribute the low death rate of only five in 91 cases to this treatment. After a little experimentation with the dosage of chloromycetin in the initial stages, it was stabilised at 87 capsules a case over a period of a fortnight, irrespective of the age of the patient. Counting the cost of treatment at the latest price of \$1.56 a capsule, this works out at \$135.72 a case. The treatment of enteric cases by chloromycetin does not

completely prevent serious complications like hæmorrhage and perforation, but it does minimise the risk. The extent to which chloromycetin helps to rehabilitate earlier than otherwise will have to be investigated further.

Tropical Typhus—Two cases of Scrub Typhus with one death and one case of Urban Typhus were treated during the period under review.

Dysenteries—90 cases of Amœbic Dysentery with four deaths and nine cases of Bacillary Dysentery were admitted; seventeen other cases were classified as Clinical Dysentery from the nature of the clinical symptoms as no specific organisms could be demonstrated.

Diphtheria—257 cases were admitted during the period, and with 9 cases remaining at the end of 1949, a total of 266 cases were treated in all. Of these 28 died, a crude death rate of 10.9 per cent. 15 cases died within 24 hours of admission. If these are excluded the corrected death rate will be 5 per cent. Of the 257 admissions 63 required immediate trachotomy; 16 of these died, ten cases within 24 hours of the operation.

TYPES OF CASES

Type	Admissions	Deaths
Laryngeal and Tracheal	97	18
Nasopharyngeal	55	10
Faucial	68	—
Nasal	2	—
Contact Carriers	35	—
Total	257	28

ADMISSION BY NATIONALITIES

Race	Admissions	Deaths
Europeans	2	—
Eurasians	3	—
Indians	6	—
Chinese	236	26
Malays	9	2
Others	1	—
Total	257	28

ADMISSION BY AGE GROUP

Age	Admissions	Deaths
1 year and under	25	5
1 - 2 years	55	8
2 - 5 years	105	13
5 - 10 years	47	2
10 - 15 years	14	—
15 - 20 years	1	—
Above 20 years	10	—
Total	257	28

This diphtheria picture is more or less the usual in Singapore as the 257 admissions in 1950 compares with 256 in 1949. The same applies in much the same way to the age incidence. Preventive inoculation is available in urban and rural areas and has been combined with whooping cough immunisation to some extent. This latter procedure was not encouraged, however, when the poliomyelitis cases increased towards the end of the year.

Measles—51 cases were admitted during this year compared with 193 cases last year. Almost all were 'in extremis' with lung complications. Prompt and adequate treatment with penicillin and sulpha drugs resulted in only one death however.

Acute Anterior Poliomyelitis—After the epidemic of 1948 and the tail-end cases of 1949, there were only eight cases admitted during the first nine months of the year. But there was a sharp rise in October, November and December, with eleven, thirty-three and twenty-nine admissions respectively. Ten cases died of this disease, deaths resulting from bulbar paralysis or poliœncephalitis. 90 per cent of the cases were in children under five years of age, paralytic in type in various degrees. Cases of respiratory paralysis were treated with Bragg-Paul pulsators. A full review of the post-war position in regard to this disease is given in Chapter Eight of this report.

The problem in this condition is after the acute stage of the disease is over. Almost all the cases have residual paralysis of varying degrees requiring prolonged institutional treatment under expert advice and the care of an experienced physiotherapist.

After careful consideration a special convalescent poliomyelitis ward was staffed and equipped for this purpose.

MENTAL DISEASE

The year 1950 has seen considerable improvement in our approach to the various mental problems which confront this Colony. Several new ventures have been undertaken and are showing good results. These include adult education, mass radiography, occupational therapy, farm expansion and other facilities for the treatment and welfare of the mentally ill.

The total number of patients treated during the year was 1,210 with a discharge rate of about 60 per cent of direct admissions, a distinct improvement over any previous year.

The main diagnostic categories were toxic confusional states, schizophrenia reaction types, manic-depressive reaction types and general paralysis of the insane.

At the end of the year there were seventy-three criminal lunatics and thirty-six cases accused of minor crimes.

Mental disease is without doubt one of our main social and medical problems and there is no doubt that the steady increase in annual admissions means that even the 10 year Medical Plan may be insufficient to meet it if the present rate continues. Some 1,800 beds with an additional 150 for mental defectives are envisaged under the scheme but beds occupied have increased from 440 in 1946 to 700 in 1947, to over 1,300 in 1950 in spite of a greatly increased discharge rate.

TREATMENTS

Two insulin shock therapy wards have now a combined capacity for twenty-four patients, but as each individual course lasts about three months the turnover cannot be rapid. During the year 100 cases were treated with an average of thirty treatments per patient (3,000 treatments). There was a 38 per cent full recovery with one death. Practically all these patients were suffering from schizophrenia and nearly all were chronic cases which are notorious for poor response to insulin shock.



Public Relations

Woodbridge (Mental) Hospital, Occupational Therapy



Public Relations

Woodbridge (Mental) Hospital, The Ground-nut Garden

MASS SURVEY, 1950
MENTAL HOSPITAL

Total X-rayed	Total assessed	PRIMARY T.B.		POST-PRIMARY T.B.		SPUTUM		Other tuberculous conditions	Other Pathological Conditions	Under observation	N.A.D.
		Active	Apparently Arrested	Active	Apparently Arrested	Pos. (+)	Neg. (-)				
(Males) 127	36	..	..	14 (11%)	15 (11.8%)	7 (5.5%)	7 (5.5%)	..	{ Not in T.B. Patient 1 Cystic Bronchitis 1 Pneumonitis 1 Old Empyema with calcified pleura. In T.B. patient.	5	..
Females) 400	38	..	2 (0.5%)	6 (1.5%)	7 (1.7%)	3 (0.7%)	3 (0.7%)	..	{ 1 Enlarged thyroid gland. 1 Bilateral Bronchiectasis 2 Pneumonitis (4 found in T.B. patients) 1 Pneumonitis.	18	4
527	74	..	2 (0.4%)	20 (3.7%)	22 (4%)	10 (1.9%)	10 (1.9%)	..	7	23	4

Persons sent for X-ray from the Mental Hospital included not only patients on a random survey, but also certain cases suspect for tuberculosis and this in part explains why the incidence is so much higher than in a random sample of apparently healthy people.

During the year research was carried out on the problem of hypoglycæmic coma. The results are being studied and will be published later.

Electro-convulsant therapy continued to be used on a wide scale. A total of 309 patients were treated with an average of nine treatments per patient. There was almost a 50 per cent recovery in these cases.

All new patients now have a routine X-ray examination of the chest, and mass radiography has already been carried out on all the female patients in hospital. A survey was made during the year and 400 females and 127 males were examined. Of these 3.7 per cent were found to have active tuberculosis. This figure is higher than the figure which would be obtained in the normal population outside. An increased tuberculosis rate is not an uncommon finding in mental hospitals and is probably due to a number of factors not the least of which is the inability of the patient to care adequately for himself prior to certification.

A small outbreak of typhoid fever occurred resulting in seven cases and was attributed to contaminated food sold illegally by a hawker.

Occupational therapy has contributed greatly to the general improvement in the well being of the patients, particularly in the female section of the hospital.

Dental treatment continued but the number of extractions was less than the previous year as more conservation work was carried out. New anæsthetic apparatus has been added to the equipment.

The laboratory has been brought further up-to-date and routine work increased. New measures include the cutting and staining of sections and colorimetric estimations. Every admission has a Kahn blood and a cerebro-spinal fluid test.

The acreage under cultivation has been increased to four acres and good crops of vegetables have been obtained, the produce being added to the working patients' diets as a form of encouragement. Almost 19,000 lb. of vegetables have been grown during the year. Groundnuts were added, with some degree of success.

Adult education has commenced, but at present the main subject is English.

The Singapore Mental Hospital Co-operative Stores Society Limited was established in the latter half of the year and the shop in the grounds was officially opened in November. It is anticipated that this venture will assist the staff in reducing its cost of living.

The nationalities of patients remaining in hospital at the end of the year were as follows:—

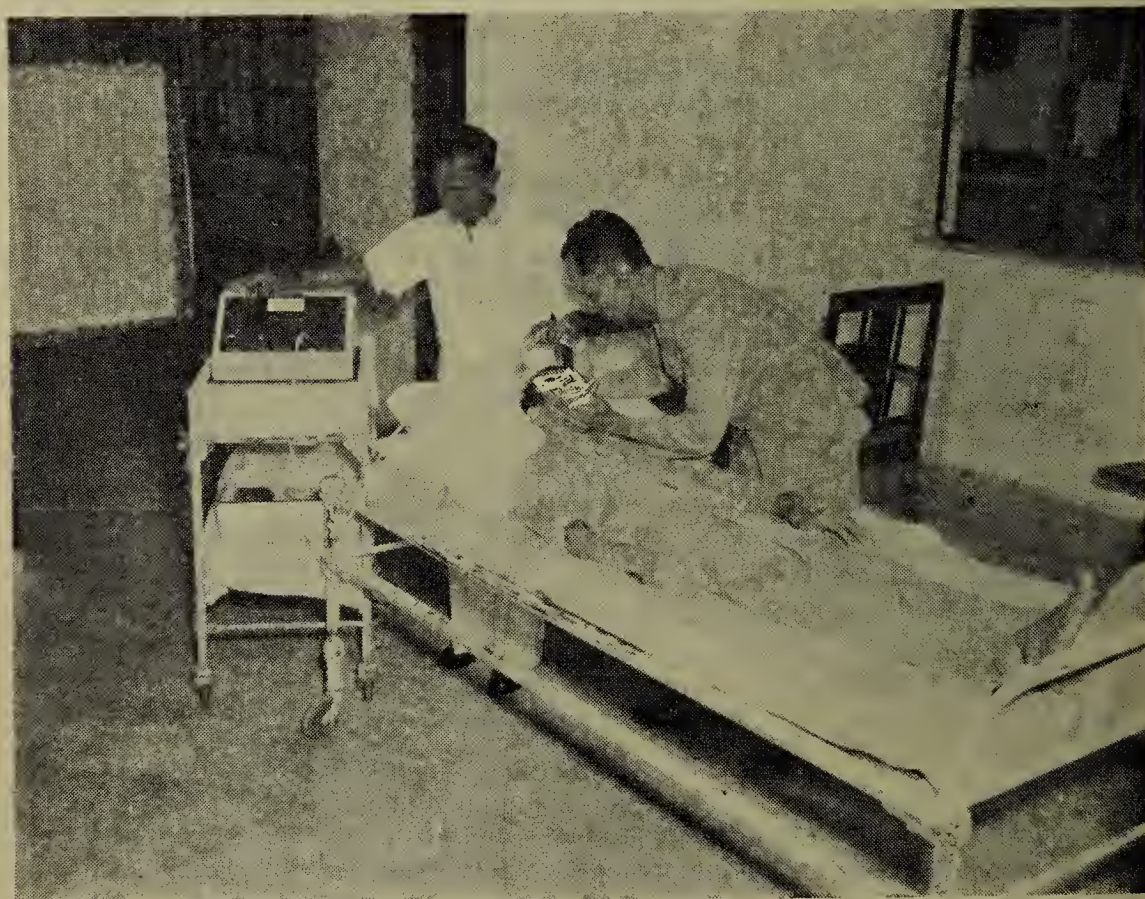
					Males	Females
European	...	...	...	...	2	—
Eurasian	...	...	...	...	9	6
Chinese	...	...	...	...	543	465
Indian	...	...	...	...	85	14
Malay	...	...	...	...	57	15
Japanese	...	...	...	...	2	—
Jew	...	...	...	...	1	—
Others	...	...	...	...	10	1
Total					709	501

Three aspects of our approach to the mental problem received particular study during the year; nursing, treatment and cooking, points of outstanding importance which had not received their due share of attention in the past. A reference to the serious concern which the lack of adequate nursing has



Public Relations

Woodbridge (Mental) Hospital, Needlework Class



Public Relations

Woodbridge (Mental) Hospital, Electro Convulsant Therapy

raised has been mentioned in all the post-war Annual Reports of the Department in view of the importance of the new treatments which are now available. The system in operation for so many years whereby reliance is placed on a very small trained staff and many hospital attendants is completely out of date. Progress in this respect cannot be rapid, however, in view of the nursing shortage which exists. Attendants are to be placed on a special 'warders' scale, however, in view of the increased and important duties involved, and the trained staff is to be steadily increased as accommodation becomes available under the Medical Plan.

Two selected hospital assistants are going to the United Kingdom for additional training as male nurses, and the 'Sister' strength has been increased by temporary additions. Occupational therapy is now recognised as a vital part of the treatment, and the diet kitchens are to be modernised.

As noted above the incidence of pulmonary tuberculosis is usually rather high amongst mental patients and Singapore is no exception to this rule. In consequence separate accommodation must be furnished for this purpose and is part of the proposed extension under the Medical Plan.

Dr. B. F. Home, L.R.C.P. & S. (Edin.), L.R.F.P. & S. (Glas.), Diploma in Psychological Education, the Medical Superintendent for many years retired in April 1950 and Dr. J. Browne, M.B., CH.B. (Q.U. Belfast) took over. Dr. Browne submitted a thesis for his M.D. during the year based on his work in this hospital.

PATHOLOGY DIVISION

The work of this division includes:—

- (a) post-mortem examinations (H.M. Coroner's cases and clinical cases) at the General, Tan Tock Seng and Kandang Kerbau Hospitals;
- (b) histological examinations of biopsy and autopsy specimens from the Government hospitals, clinics and dispensaries;
- (c) bacteriological investigations of specimens from Government hospitals, clinics and dispensaries;
- (d) serological tests of blood and cerebro-spinal fluids from Government hospitals, clinics and dispensaries;
- (e) preparations of T.A.B., cholera and autogenous vaccines, vaccines for the use of Government hospitals, clinics and dispensaries;
- (f) maintenance of a museum of specimens of pathological and medico-legal interest;
- (g) animal inoculations and injections.

The senior Pathologist continued to act as Professor of Pathology throughout the year and so carried out in addition as part of the work of the division: the teaching of pathology to medical and dental students with lectures, demonstrations of morbid anatomy and practical classes.

The account of the work done in this laboratory is not representative of Singapore as a whole because similar examinations are carried out at the Municipal and Command laboratories. Further clinical laboratories in the hospitals undertake certain biochemical, clinico-pathological, and hæmatological investigations.

The total number of investigations carried out during the year was 51,913 and a comparison with previous years is given below.

	1947	1948	1949	1950
1. Post-mortems	1,047	1,103	1,351	1,706
2. Histological Examinations ..	1,860	2,889	3,043	3,353
3. Bacteriological Examinations ..	5,338	4,757	6,352	10,247
4. Serology	20,404	22,701	27,915	36,607
Total ..	28,649	31,450	38,661	51,913
Post-mortem of H.M. Coroner's cases	758	646	763	831

The above figures show a considerable increase in the amount of the work covered as compared with previous years. In addition the number of students in Pathology has increased from twenty-three in 1947 to eighty-eight in 1950.

Though there are a number of pathological conditions of interest which the Senior Pathologist would like to investigate, the burden of the ever increasing routine, coupled with the strain of teaching duties to a large number of students, leave little time for these investigations. The staff of four available from Government and the University is ludicrously small for the purpose.

The vacancy for the Medical Officer (Jurisprudence) is still unfilled as Dr. Drury White who filled this post temporarily resigned in May to take up an appointment elsewhere.

GENERAL

Post-mortem Examinations

A total of 1,706 autopsies were performed during the year, including Coroner's cases. This shows an increase of 355 cases over 1949 figures. The number of Coroner's cases has increased from 763 in 1949 to 831 in 1950.

The following causes of death, when compared with the 1949 figures, show an increase and may be of interest:—

- Poisoning, from 71 to 95 (caustic soda 54 to 75).
- Vehicle accidents, from 84 to 97.
- Tuberculosis, from 115 to 155.
- Malignant Tumours, from 76 to 82.

The small mortality from malaria (5), dysentery (amœbic and bacillary) (15), typhoid (9), diphtheria (8), beri-beri (13) and helmenthiasis (15) shows the beneficial effects on the population of modern anti-malarial and other preventive measures coupled with the latest advances in therapeutics.

Histology—The total number of sections examined during the year was 3,353 which shows an increase of 310 over the 1949 figures. All biopsy material (2,557 sections) was fully dealt with, but sections from autopsies are still to be reported on.

Bacteriology—During the year 10,247 specimens were investigated, an increase of 3,895 over the 1949 figures, mainly due to the following examinations—culture for mycotuberculosis from Tan Tock Seng Hospital and General

Hospital, for gonococcus from the Social Hygiene Branch, for K.L.B. from schools and for sterility tests from the medical stores and hospital dispensaries.

The number of vaccines prepared during the year increased from 15,500 in 1949 to 47,840 in 1950, due to increased supply to Government departments, and inoculation of school children on account of a mild epidemic of typhoid.

Serology—36,607 specimens (34,769 blood and 1,838 cerebro-spinal fluid) were examined during the year, an increase of 8,692 over the 1949 figures.

Senior Pathologist: Dr. C. Subrahmanyam, L.M.S. (Singapore).

BLOOD TRANSFUSION SERVICE

The Blood Transfusion Service in Singapore has shown a very substantial expansion in the scope of its activities every year since the liberation, and 1950 has proved to be no exception in this respect. Unfortunately, however, the demand for this vital service from the hospitals continues to exceed the supply, a situation which has been aggravated by the reduction in the amount of blood plasma available from overseas. Action is being taken to try out synthetic blood plasma: this is a good deal more expensive than the natural product however. The machinery for making blood plasma locally is extremely expensive, and such material is very extravagant on the blood bank. In consequence it will not be possible to indulge in an expansion in this direction in Singapore until many more donors are available.

It will be noted that while most of the persons who receive emergency blood are Chinese, less than one quarter of the blood donated came from this section of the population. Early in 1949, in an attempt to overcome this difficulty, an advisory voluntary committee was formed by the Department. The enthusiasm and drive of its members is to be particularly recorded: its work and co-operation is a happy reminder of what can be done in the field of voluntary assistance to a Government Department in the medical sphere. Mr. George E. Lee donated \$3,500 to start a special propaganda drive through his colleague on the Committee, Mr. Ong Eng Lian, and Messrs. Shaw Brothers gave free and willing service in producing a propaganda film which was shown in Singapore's cinemas during the Chinese New Year. Through the generosity of the East Asiatic Company, Nestles Limited and Peter Jackson and Company donors are provided with free beer, coffee, milk and cigarettes. The Committee worked out details of a special propaganda drive to coincide with Chinese New Year during which all donors, past and future, received due recognition according to the number of donations of blood each had provided by means of certificates, badges and medals, a form of recognition which was continued and has now become a permanent feature. The valuable assistance of the Public Relations Secretary and his staff has been noted by the Committee in this connection, as is that of Mr. R. Walker, O.B.E. in the designing field.

The Secretary-Supervisor of the Transfusion Unit has to spend much of her time in the effort of persuading the public to come forward as donors through personal contact. Ward sisters and nurses of the Hospital Service also attempt to get all friends and relatives of patients who have received blood to come forward. It was felt that many more people in this category should be available to replace the blood in the bank. Quite a fair response is received from the poorer classes but the response from the middle and the more wealthy sections of the community is almost nil in this respect.

Like other countries in the British Commonwealth we still rely far too much on the altruistic few. No monetary awards are given to our Blood Donors and nothing is charged for Blood Transfusions given in the hospitals. The Blood Transfusion Service is supported entirely by the Government for the benefit of the people of this Colony. The Chinese community benefit most of all. In 1950, 2,406 Chinese received blood transfusions, whereas only 875 gave their blood.

Our methods of obtaining donors follow the usual lines of personal contact, newspaper articles, radio talks, pamphlets, posters, and daily publication of statistics of the blood bank. Particular thanks in the latter connection go to the *Malaya Tribune* Press. Every special effort results in a temporary increase in donors and such affairs as the civil riots stimulate the public interest in this connection.

One of the main difficulties continued to be that of a constantly changing staff and every effort will have to be made to make the personnel permanent if such an important activity is to be efficiently run. Once the necessary training has been acquired it is essential that technicians and others remain.

The following is a tabulated statement of the 1950 donors and recipients classified by race:—

Donors			Total	Blood Groups				Recipients
				O	A	B	AB	
Europeans	..	..	1,705	840	620	178	66	43
Chinese	..	..	875	393	211	223	48	2,406
Indians	..	..	339	127	67	126	19	412
Malays	..	..	556	212	172	142	30	150
Eurasians	..	..	219	117	35	53	14	35
Others	..	..	27	12	9	7	..	12
Total			3,721	1,701	1,114	729	177	3,070
1949	..	..	2,946	1,333	870	585	158	2,550
1948	..	..	1,622	769	485	304	63	1,315
1947	..	..	996	538	263	167	28	725

(287 only in 1946)

Actual number called: 3,989 Donors rejected: 113

Relatives rejected: 155

Service personnel: British—1,074
Others 469

Local Population: 2,016 of which number only 422 were relatives.

ANALYSIS OF DISTRIBUTION

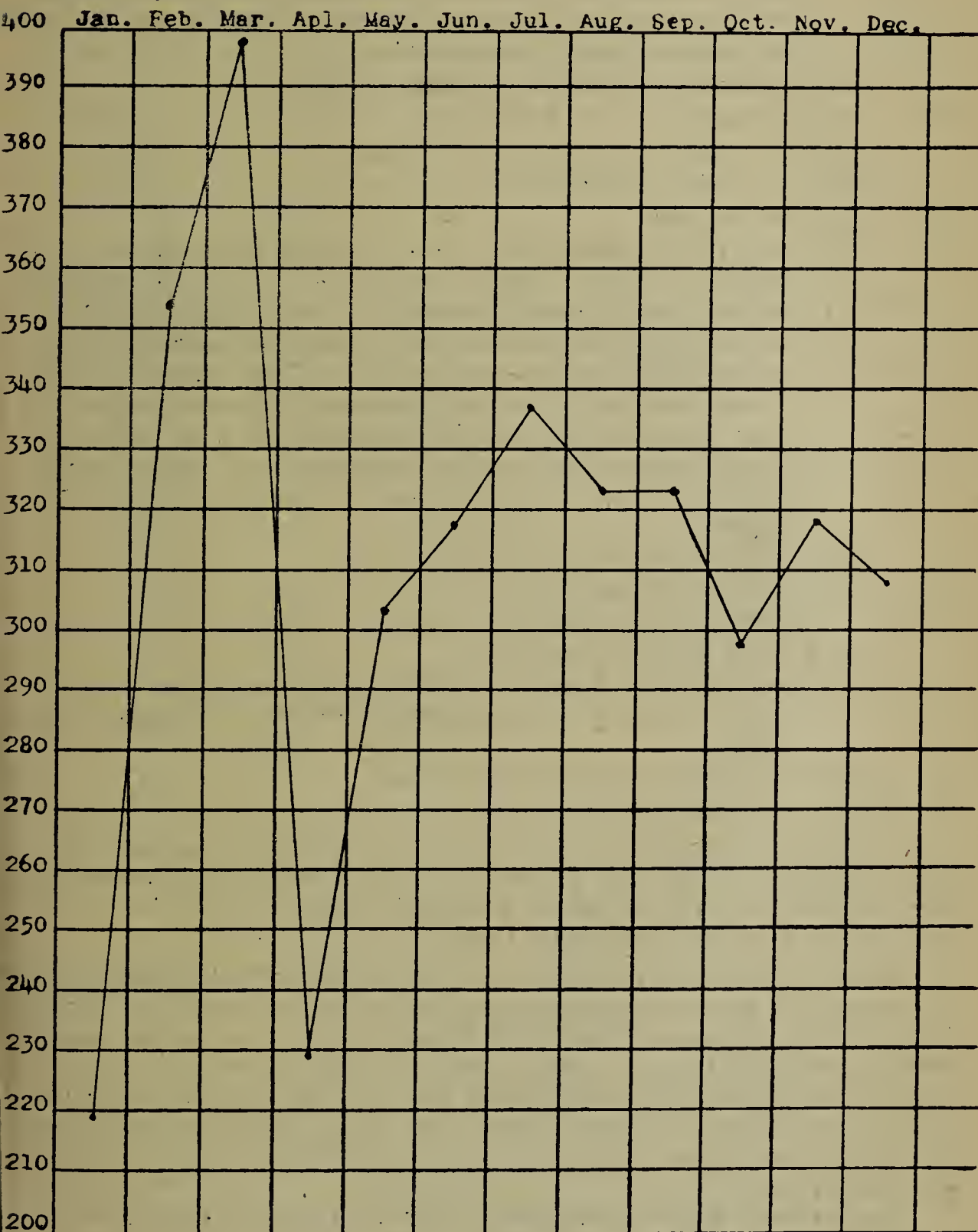
General Hospital	...	...	...	1,377
Kandang Kerbau Hospital	...	...	...	1,633
Tan Tock Seng Hospital	...	...	...	26
Middleton Hospital	...	...	...	5
Others	...	...	...	29
Total				3,070

BLOOD TAKING AND BLOOD GIVING SETS

Number of Donors	... 3,721	Sets used	... 3,772
Number of Recipients	... 3,070	Sets used	... 4,656

Saline Sets are issued separately to the Wards as required; to be kept and sterilised in the Wards.

DIAGRAM SHOWING BLOOD DRAWING FOR TWELVE MONTHS ENDED 31st DECEMBER, 1950



Work done consists of:—

- (1) The taking and storage of blood.
- (2) Blood grouping. Prior to 1949 the 'tile' method of blood grouping had been employed but the more accurate method of 'tube' grouping is now in use. There are four blood groups common to all human beings, namely AB, A, B and O. If a patient requires a transfusion he should be given one of his own blood group, but if this is not available a transfusion of group 'O' (commonly known as the 'universal Group') can be substituted. 'O' blood may also be used in case of emergency where a specimen of the patient's blood is unobtainable.
- (3) Hæmoglobin estimations and blood counts.
- (4) Examination of blood films.
- (5) Kahn testing.
- (6) Direct and cross-matching.
- (7) Blood cultures.
- (8) Testing for the Rhesus Factor. The red blood corpuscles of a percentage of persons contain a factor known as Rhesus (Rh), but normally human plasma contains no anti-Rh agglutinins. Consequently hæmolysis will not occur when Rh positive blood is transfused into an Rh negative recipient. There may, however, be a slow formation of anti-Rh agglutinins in the recipient, and if after a long interval a further transfusion from an Rh positive donor is given these anti-Rh agglutinins may produce serious hæmolysis. Steps are being taken to complete a panel in this respect.
- (9) Preparation and issue of packed cells.
- (10) Preparation of liquid plasma.
- (11) Preparation of anti-coagulant solutions.
- (12) Fragility tests on stored blood.
- (13) The preparation, dismantling, cleaning and sterilisation of blood-giving, venesection and intravenous sets for the Singapore hospitals.
- (14) Preparations of double-distilled water.
- (15) Investigation of blood transfusion reactions.

Reactions—During 1950 the percentage of reactions following blood transfusion was $2\frac{1}{2}$ per cent. This includes all types of reaction and no fatalities were recorded. According to statistics published in other countries this $2\frac{1}{2}$ per cent appears to be within reasonable limits.

Rhesus Typing—For the past four to five months it has been possible to Rhesus type all donors and recipients. All Rhesus negative bottles are clearly labelled 'Rhesus Negative Blood'. There has never been a large enough supply of Rhesus Negative Blood in stock to enable us to give it out as a routine in cases of emergency. This is unfortunate but it is not so important in this Colony as in European countries. Most of the people who receive emergency blood here are Chinese. So far not one Chinese Rhesus negative has been discovered by us.

One European baby was successfully treated for hæmolytic disease of the newborn in 1950. No other cases have occurred.

Some interesting facts have been gained in routine Rhesus-typing :—

<i>Nationality</i>	<i>Number of Donors tested</i>	<i>Rhesus Negative Donors</i>
European	479	14 per cent
Chinese	220	Nil
Indian	96	5 per cent
Malay	110	2 per cent
Eurasian	50	2 per cent

The Service continues to be housed in accommodation which is both inadequate and unsuitable, in rooms set aside in the Pathology Division. Although all that can be done to improve the accommodation has been done, the fact has to be faced that further real expansion cannot be attempted until a proper building has been provided for this purpose. In consequence steps were taken towards the end of the year to include a separate section for the purpose in the design of the new out-patient department then in course of completion.

Five years experience has made it clear that a Chinese community will never supply enough blood for the developing hospital services. Thus while every effort must be continued to expand the local service in this respect a synthetic bank must be raised in addition now that this form of substitute is coming on the market in sufficient quantities, although such material will never equal the human product. This is especially important in connection with Civil Defence needs. Steps are proceeding in this connection.

Retaining Donors—It is of primary interest to take care of the donor's general interests and health. This is accomplished by the following methods :—

- limitation of calls made on donors. An accurate filing system is maintained, and donors are called strictly in rotation;
- donors' criticisms, suggestions and complaints are sympathetically dealt with. This personal interest in, and sympathetic treatment of the donor at the time of his attendance to give blood goes a long way in ensuring that he will return;
- the Medical Officer examines every donor. If the donor is found to be unfit he is rejected;
- recognition of 'Service': Donors are given a certificate at their first attendance, and thereafter a numbered enamel badge until the tenth donation is reached, when a silver medal is presented. On the eleventh to nineteenth donations the enamel badges continue, and at the twentieth donation a gold medal will be given. Nine people were awarded silver medals in 1950.

Blood Transfusion Officer : Mrs. M. G. Maclaren, M.B., CH.B. (Glas.).

PRISON HOSPITALS

Both Outram Road Gaol (correctly referred to as the Pearl's Hill Prison) and Changi Prison have small hospitals attached to them where sick offenders are treated. In addition there is a detention ward in the General Hospital for more important cases, and the police have under their control a certain number of detainees in a camp on St. John's Island who, if requiring medical attention, are dealt with by a visiting staff from Outram Road Gaol.

OUTRAM ROAD GAOL

The general health of offenders has been satisfactory, there being only one case of chicken pox and one case of mumps. While the daily average of offenders was 730 the number of cases admitted to the hospital during the year was 628 compared with 637 in 1949. The average daily number of in-patients was 34. There were only 7 deaths.

Inoculations and vaccinations numbered 330 and 3,800 respectively. In addition 639 dental extractions and other essential dental repairs were carried out.

Total attendances at out-patients numbered 4,597, the daily average being: 15. In addition, treatment for minor complaints was given in the workyards by the hospital assistant who visited there daily.

CHANGI PRISON

No epidemic, and no contagious or infectious disease occurred in this prison during the year. The general health was very good and there were no deaths. The daily average of offenders was 756 as against 833 the previous year and the total number of patients admitted to the hospital was 266 as against 514 in 1949. The daily number of in-patients averaged 12. The total number of out-patient attendances was 46,500, the daily average out-patient figure being 127.

The principal diseases treated were influenza, nasal catarrh, skin conditions, diarrhoea and minor injuries.

Eight major and 185 minor operations were performed. Greater attention was paid to oral hygiene and 936 dental extractions, fillings, etc. were dealt with. Spectacles were supplied to 20 offenders.

There were 28 new cases of venereal disease.

No single case of vitamin or nutritional deficiency was observed, and it was noted that since the regular supply of red palm oil furunculosis no longer occurred.

During the year offenders working with coconut husks developed a peculiar condition of the soles of the feet, but this cleared up on wooden clogs being supplied.

DETENTION WARD—GENERAL HOSPITAL

The total number of cases admitted to this special ward during the period under review was 285. Of this total, 225 were admitted for observation. 176 cases were certified insane and transferred to the Mental Hospital. There were 15 cases of caustic soda and 5 cases of other poisoning.

POLICE HOSPITAL

During the year a total number of 825 in-patients were treated in the Police Hospital, the daily average being 8 persons. Total attendances at out-patient clinics were as follows:—

	New Cases	Repetitions	Total Attendances
Hill Street, Families Clinic ..	2,642	16,581	19,223
Police Training School ..	2,455	3,683	6,138
Total ..	5,097	20,264	25,361

110 police wives were 'confined' in barracks but there is an encouraging tendency for increasing numbers to prefer admittance to Kandang Kerbau Hospital. This is particularly so in the case of the wives of the Gurkha Contingent. Considerable persuasion has had to be used in some cases and advantages of hospitalisation continue to be stressed.

In addition to conducting a clinic at the Police Station in River Valley Road where there is a dispensary and examination room, the Lady Health Officer visits all stations in Singapore in regular routine. Of the 2,574 cases of disease treated, 1,144 were of worm infestation.

In many of the smaller stations the inhabitants have to depend on wells for their water supply. It is hoped that the proposed extension of water mains to all parts of Singapore Island will allow all stations to be provided with piped water within the next five years.

GOVERNMENT MEDICAL STORE

During the year the Base Medical Stores carried on very smoothly its two main functions which are:—

- (a) as a bulk buying office and distributing centre for all the hospitals and clinics in supplies of drugs, dressings, textiles for uniforms and bedding, surgical instruments and other equipment; and
- (b) as a small-scale pharmaceutical manufacturing unit preparing emulsions, ointments, ampoules and multiple dose injections, saline packing, tablet manufacture, and the making of various tinctures and other pharmaceutical preparations. When a supply section works smoothly it is working successfully, and since there were no major worries or upheavals over stocks running out or unobtainable at short notice we may take the year as being the most successful since the end of the war.

Requisitions from hospitals for supplies were dealt with promptly, and at no time during the year was there a pile-up of orders such as has occurred in the past. The store records are now kept in kardex cabinets, and the number of items in stock totalled over 7,000. Checking stock levels to this degree is a considerable undertaking: yet at the end of the year stocks were at a reasonable level in almost all cases. 1.4 million dollars were available in the estimates for purchase of unallocated stores. Over half of this sum was laid out in the first three months through indenting for bulk supplies with the Crown Agents for the Colonies, and towards the end of the year in view of the rapidly rising trend of prices it was deemed desirable to place orders for some \$100,000 worth of further stocks of textiles to the limit of the money available. Rising prices became particularly evident in December when the Crown Agents notified considerable increase in the cost of sheeting, drill, calico and twill. Nevertheless, the stock position at the end of the year was better than at the end of 1949, and good stocks had been built up of most uniform materials either in hand or contracted for, and the cotton-wool, lint, gauze and bandages position was also satisfactory.

The consumption of anti-biotics makes an interesting study. The figures given represent store issues and therefore are the quantities used in all government hospitals. The main feature is a tremendous increase in the use of procaine penicillin, and that without any proportional decrease in the use of penicillin

sodium which increased steadily quarter by quarter. The cost to Government of sodium penicillin used, surprisingly, was approximately the same for the second half of the year as for the first. This is accounted for by two manufacturer's price reductions, but more so by discontinuation of the 100,000 unit pack and increased use of the economical 1 mega U pack instead of the 1/5 mega U. This will not apply next year since there is unlikely to be more than a slight further reduction in the price of penicillin, if any. The present landed cost of 1 mega U vial is \$1.48 which after 6 successive reductions since June 1946 is thought to be about rock bottom.

In the second half of the year over twice as much was spent on procaine penicillin as in the first despite the price reduction.

Approximate total value of issues of anti-biotics to hospitals were:—

			\$	\$
Penicillin (Sodium)	...	...	85,000	
(Procaine)	...	...	50,000	135,000
Streptomycin	...	...		40,000
Chloromycetin	...	...		18,000
Aureomycin	...	...		16,000
Total				209,000

Issues to hospitals were:—

		All packs of Sodium Penicillin in terms of Mega U	Procaine Penicillin in terms of Mega U	Streptomy- cin 1 grm. vial	Chloromy- cetin 250 mgm. caps.	Aureomycin in terms of 250 mgm. caps.
January—March	..	8,200	2,600	8,600	3,470	830
April—June	..	9,400	4,400	6,200	2,800	2,880
July—September	..	10,600	4,300	7,000	2,030	3,090
October—December	..	12,500	10,800	6,400	2,010	4,050

It will be seen that there was no increase in the use of streptomycin, the figure for the fourth quarter of 1949 being just over 10,000 grammes. This may be due partly to the Government arrangement with S.A.T.A. but also to alternative treatment and to decreased use of streptomycin in hospitals other than Tan Tock Seng. Of the two expensive American drugs, aureomycin was increasingly used, but in the absence of serious typhoid only about 2,500 grammes of chloromycetin was required.

Of the 1.4 million dollars available, \$250,000 was spent locally. Medical gases, X-ray films and soap continued on local contract, while stocks of rubber tubing, vaccine caps, and locally manufactured products were purchased in the

Colony in addition to coconut oil and other items. The transport and shipping section worked admirably, supplies from United Kingdom arriving regularly and with very few losses or damage in transit. A Board of Survey was again convened and commenced a comprehensive check of the drugs and chemicals section of the store. It was soon realised, however, that this was too formidable a task for such a small Board and the work was postponed. It is hoped that a complete stock check can be carried out either before or during the transfer of stock to the new premises early in 1951.

During the year the hospital supply arrangement was extended by agreement to the Singapore Anti-Tuberculosis Association to whom Government made a grant of \$10,000 for purchase of medical supplies. S.A.T.A. can now and does draw medicines, dressings and hospital equipment at net landed cost from the Government Medical Store.

At 31st December the division was still housed in the old St. Andrew's Mission Hospital in Maxwell Road, but during the year the first stage of new premises at the General Hospital had been almost completed. The first four of the Medical Store buildings were completed on the site of the old Sepoy Lines Golf Course. Two large godowns with shelving, an inflammable store, and a block of 4 garages and 2 workshops, with drivers quarters on the upper floor, were almost finished. It is hoped to move into these premises early in 1951, and construction of another block consisting of administrative offices and laboratories should then be on the way. The provision of proper laboratories will relieve a very serious present supply problem. The laboratory section managed remarkably well with the quite inadequate equipment and premises at present available as the work to be done increased considerably, the number of laboratory works tickets completed being well over 1,000, and with larger batches in many cases. The range of pharmaceutical lines which have been manufactured now appears on the store records as over 400. While many of these are odd preparations, there are about 40 types of standard ampoules or multiple dose injections and 16 different kinds of tablets being manufactured all the time in batches of 1,000 ampoules or 100,000 tablets respectively. All these preparations are far less expensive when made on the premises than if purchased ready-packed from manufacturing firms. As has been reported before, the emergency supply arrangements on re-occupation of the Colony included excessive supplies of various pharmaceuticals, some of which could not be used. These had deteriorated in quality: others are still in stock: some have been sold. However, many have been in steady use. Often the end of the Y.W.P. stock means another job for the laboratory. This year our large 1946 stocks of coramine, stibophen and codeine tablets, and nikethamide injections have all run out: another big job for the ampoule section.

Orders were placed during the year for new equipment for the laboratories which are to be built in 1951. This includes a second tablet machine, a mixer-emulsifier which operates its own pump, steam heated still, and evaporating pans, and various minor equipment such as a vaccine bottle scaling machine.

There were very few staff changes, the division still being run mainly by Hospital Assistants. It is proposed to replace these eventually by storekeepers and laboratory assistants but this must of necessity be a slow process as these men must be exceptionally well trained. There are still nine hospital assistants in the store section and four in the laboratory. The post of Inspecting Officer, Pharmacy Board, remained vacant, and poisons inspections had to be undertaken by the

Superintending Pharmaceutical Chemist himself. More checking of licensed premises was carried out but the time required for this work could be ill spared. An attempt was made to check all licensed premises selling caustic soda so ensuring that none is sold other than in accordance with the requirements of the Poisons Ordinance. It remains to be seen whether this will have any effect on the number of admissions to the General Hospital of caustic soda poisoning cases.

In September, excess stocks of sulphonamide, quinine and mepacrine tablets were sold by public tender and realised \$74,000. These drugs were sent out under the emergency supply B.M.A. arrangements in 1945/46. Hence the sale before they deteriorated.

There are about thirty pupil pharmacists attending the 1951 University of Malaya pharmacy course, and when this group qualifies it is hoped that a Poisons Inspector will be appointed and some of the pharmacist vacancies in hospitals will be filled.

Superintending Pharmaceutical Chemist: D. E. Lovett, B.PHARM. (Lond.), PH.C.

APPENDICES

APPENDIX I

THE FUTURE

REPORT OF A SELECT COMMITTEE OF THE LEGISLATIVE COUNCIL ON THE MEDICAL PLAN FOR SINGAPORE

1. At a meeting of the Legislative Council held on 18th May, 1948, a Select Committee consisting of the Acting Financial Secretary, Mr. M. J. Namazie, Mr. C. C. Tan, Mr. P. F. de Souza and Mr. Lim Yew Hock was appointed to examine and report to the Legislative Council on 'The Singapore Medical Plan' prepared by Dr. W. J. Vickers, Director of Medical Services, Singapore, and set out in Council Paper No. 4 of 1948.

2. It is observed that the Plan was first placed before the Advisory Council as Council Paper No. 12 of 1947. In this Plan a total capital expenditure of \$51,082,000 was envisaged over a period of five years. Additional items amounting to \$7,736,000 were marked for consideration if possible. The date of this Plan is 11th February, 1947. It was necessary to review this Plan for two reasons; firstly, the impossibility of providing funds on such a scale over so short a period, and, secondly, the incapacity of the Public Works Department of the Colony to undertake so vast a task in addition to its normal works. In consequence, the Director of Medical Services, with the assistance of a Committee consisting of the Principal of the College of Medicine, the Chief Health Officer, the Chief Medical Officer, the Professor of Surgery, the Professor of Midwifery, Dr. Haridas and Dr. Nicholas, suggested some modifications to the original Plan in February, 1948. The original Plan, together with the modifications recommended by that Committee and a note by the Director of Medical Services on how the Plan arose, are all contained in the Council Paper first mentioned, namely, Legislative Council Paper No. 4 of 1948. The actual details of the Plan, arranged as a Ten-year Plan and as a Fifteen-year Plan, are shown in the Schedule on pages 26 and 27 of the Paper.

3. The Committee held meetings on the 7th and 17th of June, the 8th, 22nd and 30th of July, on the 12th August and on 8th September, 1948. The Director of Medical Services (Dr. Vickers) attended the meetings throughout and assisted us greatly with explanations and advice. The Director of Public Works (Mr. Kirk) and the Government Architect (Mr. Cuthbertson, and, later, Mr. Brundle), also attended most of our discussions and provided us at very short notice with numerous sketch-plans and figures; and the Committee wishes to acknowledge with gratitude the very valuable assistance given to us by these Officers. The Committee also paid a visit to the General Hospital and saw every aspect of the work there. This was most valuable to us not only for the practical view it enabled us to take of the particular problems there but also for the knowledge which it enabled us to apply to the consideration of other aspects of the Medical Plan generally. In addition, two members made a special visit to the Venereal Diseases Hospital, and the Chairman was able to give Members first-hand information gained by him in extensive inspection of the Leper Settlement, the Quarantine Station at St. John's Island and the Tan Tock Seng Hospital.

4. The Committee desires to state at once that the Medical Plan is one which, in our opinion, should, subject to the comments and modifications set out in this Report, be accepted. In this connection we wish to emphasise that we decided not to concern ourselves with the question to what extent the Colony can afford to execute this Plan. That is a question which it will be possible to answer only when all the other calls likely to fall upon the Colony during the next few years are known. There are many items in view—the University, Housing, Education and Social Welfare, Changi Air Port, etc.—which will make formidable demands upon the finances of the Colony. It will be necessary for all of them to be fitted into the picture before it can be seen in proper perspective. As regards the Medical Plan, the problem to us took the form of a simple question—Does Singapore need this Plan? And our answer to the question is 'Yes'. We agree with the opinion of the substantive Financial Secretary (Mr. J. D. M. Smith) as expressed in a Minute he wrote on the 29th December, 1947. In that Minute he stated:—

‘.....I think that the correct approach to the Plan as a whole is first to discuss medical policy as such and on its merits, without intruding the financial aspect. It is obvious that the Colony can never spend on medical services any more than it

can afford to spend at any time on medical services. Therefore, once the main lines of medical policy are settled, the Colony then spends along those lines what it can afford to spend. And the breadth of those main lines of policy, in relation to the lines of policy in other fields, will determine the ratio of expenditure on medical services.

The first step, therefore, is examination of the Plan on its merits as a statement of medical policy in the Colony.....'

In stating our agreement with these views, we do not, of course, mean to infer that the amount which the Colony can afford to spend on medical (or for that matter other) services is necessarily to be governed by present revenue figures. It may be necessary, and probably will be necessary, to find additional funds to carry out this and other Plans. Some of this may have to be by additional revenue; some from loans. What we mean is that we have considered this Plan independently of financial considerations; we think that we should the better discharge the duties laid upon us by trying to arrive at conclusions as to whether the Plan is in itself a desirable plan of medical policy. The case for the Plan is fully and ably set out in the Council Paper, and we have no intention of trying to add further reasons to those already given. We consider that it is a desirable Plan, and not only desirable but necessary if the Government is to meet its obligations to the people of the Colony.

5. We should like at the outset to refer to one matter which intruded itself upon all our discussions. It is the question of quarters. It was quite clear to us that the question of the provision of quarters for the institutional staff of the Medical Department is one upon which most of the others depend. Until considerably more accommodation is available, extensions and improvements in other directions will be of no avail. The Committee which assisted Dr. Vickers have dealt with this aspect of the problem in paragraph 5 of their Report (Annexure *B* to the Plan). They say:—

'Until more staff accommodation has been provided further recruitment and expansion is out of the question. The Committee wishes to bring this fact forcibly to the attention of Government: proper and up-to-date quarters for existing staff is first priority, and must take priority over further hospital expansion.'

We have made a close examination of this aspect of the Plan and have no hesitation in supporting the above opinion. We gather that the housing position of Government servants generally is unsatisfactory. Nevertheless we consider that the problem of accommodating hospital staffs takes priority over any general scheme. We consider, therefore, that medical quarters should be regarded not only as a part of the Medical Plan, but as its most urgent part.

In connection with the question of quarters, the Committee is unanimously of the opinion that a better type of quarters for the lower grades of hospital workers should be provided. We feel strongly that the building of the one-room type of quarters should be discontinued and that quarters with two rooms of somewhat smaller size should be provided in future.

6. We now deal with the individual items shown in the Schedule to the Plan:—

1. BASE MEDICAL STORE, PHARMACY SCHOOL AND ESSENTIAL MANUFACTORY

The purpose of this Store is to safeguard medical stores which arrive in the Colony, to make possible the local manufacture of expensive drugs with an ultimate saving to Government by so doing, and to concentrate the storage and manufacture at one point. We inspected the plans and the proposed site for this Store and approve them. We recommend that this item be included in the Plan. Further investigation has revealed that the building can be built and equipped for about \$450,000, which gives a probable saving of \$250,000 on the estimate shown in the Schedule to the Plan.

2. LEPER SETTLEMENT

The Committee is in entire agreement with the Director of Medical Services that the accommodation at the Leper Settlement is both inadequate and unsuitable. For these reasons, we consider that the amount of accommodation ought to be considerably increased and that the type of accommodation should be improved by progressively providing semi-detached quarters wherever desirable. Ancillary works in the form of roads, water supply and sewerage should also be provided. We investigated the estimates as far as it was possible for us to do so, and we agree that the estimate of \$780,000 is a fair one. The Committee was informed that this item has been entered as one for allocation of funds from the Colonial Welfare and Development Fund, and that it should stand

a good chance of being accepted as such. We consider, however, that it is a proper item to be included in the medical Plan and that, therefore, it should stay in the Plan, irrespective of where the funds come from with which to implement it.

In making the above recommendation, the Committee assumed that the necessary extensions and improvements will be carried out on the present site at Yio Chu Kang. At a late stage in our discussions, however, the Committee was asked to consider a suggestion to remove the Settlement from its present site to one of the neighbouring islands. As no alternative investigations on these lines had been made, and as no information is available as to whether a suitable site could be found or as to what the project would cost if such a site were available, the Committee considered it undesirable to delay this Report for such investigations to be made. Moreover, for various reasons, the Committee considered that the extensions and improvements should be carried out on the present site. In the absence of information, Mr. C. C. Tan wishes to reserve his opinion on this point.

3. GENERAL HOSPITAL

This is the largest and most important item in the Medical Plan, and we are completely satisfied that it is necessary. We visited the hospital and thoroughly examined the proposed improvements and extensions. In the original plan two General Hospitals were envisaged, each to take 1,000 beds. This was to be achieved by modernising the present hospital at a cost of \$10,300,000 and by the building of a second hospital at a cost of \$21,500,000.

The Committee which assisted the Director of Medical Services early this year, upon reviewing this part of the Plan, recommended that the present General Hospital should be extended to take 1,500 beds to overcome the delay involved in implementing the original scheme. This recommendation was incorporated in the schedule to the Plan as item No. 3 at an estimated cost of \$16 millions, whilst a second item (No. 14) provided for one or two District Hospitals at a later date at an estimated cost of \$11 millions. These were to provide a further 500 beds. The main lines upon which the extension of the General Hospital is proposed are:—the provision of quarters, a proper out-patient Department and Clinics, an up-to-date Children's Block and a satisfactory Pathological Block.

As stated above, the cost of the proposed improvements and extensions at the General Hospital is shown at \$16 millions. We examined the estimates in detail and a breakdown of revised estimates is contained in Appendix 'A' to this Report. It will be seen that two-thirds of the estimates of expenditure are accountable to the building of quarters. We most emphatically agree. We are pleased to report that further investigation has shown that a saving of approximately six millions can probably be effected on this part of the Plan, but we would emphasise that final estimates cannot be given with complete accuracy until the fullest investigations are made. We strongly recommend that this item should be proceeded with without any more delay than is necessitated by the capacity of the Public Works Department to do the work. We consider that it is the most urgent need, and that, if the work can be pushed on with quickly, the building of District Hospitals, which we shall deal with later, can wait.

The Committee agrees with the recommendation at the end of paragraph 8 of the Report of the Committee which assisted the Director of Medical Services (Annexure B to the Plan) that the bed ratios among the different classes of patients should be 80 1st Class, 200 2nd Class and 1,220 3rd Class.

4. KANDANG KERBAU MATERNITY HOSPITAL

The Committee is entirely satisfied with the proposals for the extension of this hospital. Here again, the main cost will be on account of quarters. A breakdown of the estimates is shown in Appendix B to this Report. A Schedule of proposed accommodation is shown in Appendix C from which it will be seen that the ward additions will give a bed ratio of 35, 77 and 410 as between Classes I, II and III excluding provision for labour rooms (1st Class 3 bed size: 2nd Class 6 bed size and 3rd Class 27 bed size) and isolation rooms (1st and 2nd Class, ten: 3rd Class 20 rooms).

5. RURAL CLINICS AND DISPENSARIES

The provision in this part of the Plan is for 16 clinics at \$41,000 each and three dispensaries (with quarters for Hospital Assistants and Hospital Attendants) at \$19,000 each. Thirteen of the Clinics will be established at the following places:—

Paya Lebar.
East Coast Road (8 mile).
Thomson Road.
Ulu Bedok.
Pulau Tekong.
Holland Road.

Pulau Bukom Kechil.
Sembawang.
Pasir Panjang.
Pulau Brani.
Tampenis (5 mile).
Jurong Road (17 mile).

Yio Chu Kang (6½ mile).

We agree that the choice of the three remaining sites should be left over until more information is available as to how the needs of the population will develop. The dispensaries will be sited at Changi, Sembawang and Pasir Panjang.

The need for these Clinics is stated in paragraph 13 of the Medical Plan and is the subject of severe comment in paragraph 16 of the Report of the Committee which assisted the Director of Medical Services (Annexure *B* to the Plan). We are satisfied with the need for the proposals made and agree that the distribution proposed is suitable. Ancillary work will cost a further 10 per cent, making \$784,000, a slight increase upon the estimate shown in the Plan.

Most of the expenditure for this item also, we were informed, has been entered for allocation under the Colonial Development and Welfare Fund, and the remarks we have already made in regard to the Leper Settlement apply to it.

6. ST. JOHN'S ISLAND WATER SUPPLY

We did not visit St. John's Island, but the Committee took note of the publicity that the Quarantine Station has received in the press and discussed the question at length in Committee. The problem of the water supply is a difficult one, and investigations are not yet completed. We consider, however, that the item is one that should be accepted. We were informed that it was hoped to receive an allocation covering the whole cost from Colonial Development and Welfare funds and the remarks we have made in regard to the Leper Settlement and the Rural Clinics and Dispensaries apply to this item. Until such time as fuller investigations can be made and firmer estimates prepared, we recommend that the provision of \$250,000 should stand in the Plan.

7. SCHOOL MEDICAL AND DENTAL CLINIC

The Committee discussed this item at some length, but the discussions turned mainly upon the site. We are entirely satisfied with the necessity for the provision of such a clinic, but consider that the closest attention should be paid to the choice of the most suitable site and that, if necessary, land should be purchased. The breakdown of figures for this work is as follows:—

						\$
Building	...	...	...	...	...	122,000
Piling	...	...	...	...	...	24,000
Staff Nurse Quarters	3	...	...	...	...	25,000
Hospital Assistant Quarters	1	...	...	...	...	15,000
Hospital Servants' Quarters	2	...	...	...	...	9,000
Ancillaries at 10 per cent	...	...	...	...	...	19,600

making in all approximately \$215,000, a slight addition to the estimate as shown in the Plan.

The estimate for piling is, of course, based on the present site proposals, and if our recommendation for the investigation of a suitable alternative site is accepted, it is possible that the overall estimate can be reduced on this account.

This item is also included in the proposals for allocation under the Colonial Development and Welfare Scheme, and the remarks we have made in regard to such items apply to this one.

8. SEA AND AIR PORTS

It was explained to the Committee that a considerable amount of work would have to be done in the next few years if Singapore were to present its quarantine facilities as models, as it had done in the past. The work would fall into two parts, namely, the rehabilitation and extension of the quarantine station at St. John's Island and the provision of facilities at the new Changi Airport. The St. John's Island station was designed thirty years ago and in the main was satisfactory, but the neglect from which it had suffered during the war, and modern requirements in respect of quarantine, demanded complete rehabilitation. It is proposed that of the sixteen existing Camps eight should be reconstructed at a cost of \$400,000, and that the other eight should be rehabilitated at a cost of about \$152,000. The plans for quarantine arrangements at Changi Airport are not ready yet, but it was expected that something like \$270,000 would be required for this work.

The Committee agreed with these items. The Committee was informed that part of this work had been entered as one for an allocation of funds from the Colonial Development and Welfare Fund. The full amount could not be entered owing to the

overall limit set for medical items in that scheme by the Singapore Committee dealing with the matter, but it was hoped to obtain sufficient money from the Fund to pay for one-half of the cost of the proposed work at St. John's Island. The remarks we have already made in regard to projects listed under the Colonial Development and Welfare Fund apply, therefore, to this item.

9. VENEREAL DISEASES HOSPITAL

Considerable discussion took place in the Committee in respect of this item, during which the desirability of making suitable provision at the General Hospital was considered as an alternative to having a Special hospital for the treatment of venereal diseases. The Medical Plan envisages a Hospital to accommodate 200 persons at a cost of \$4½ millions. The Committee eventually came to the conclusion that the building of a new Hospital to accommodate 200 persons should be postponed for further consideration in a few years time, that the work should continue to be done in the present hospital at Middle Road, but that the accommodation should be increased by making available those parts of the building that are at present used for staff accommodation, and building staff accommodation elsewhere. It was estimated that in this way accommodation could be increased from 50 to 120 beds. It was further considered that one clinic should be built at a suitable place, and that a travelling dispensary organisation should also be provided. The Committee recommends that the present buildings and the land on which they stand should be acquired under the provisions of the Land Acquisition Ordinance.

It is, therefore, recommended that item 9 be omitted from the Plan for the time being and that a new item on the above lines be substituted. A breakdown of the Estimates is shown in Appendix *D* to this Report.

We desire to emphasise, however, that it may be necessary to reconsider this problem in a few years' time.

10. ORTHOPÆDIC HOSPITAL

In connection with this item the Committee would refer to the additional item on page 7 of Council Paper No. 4 of 1948, namely a Tuberculosis Hospital of 300 beds at an estimated cost of \$5,871,000. The Committee discussed the question of hospitalisation for tuberculosis at considerable length with reference to Council Paper No. 24 of 1948 prepared by the Director of Medical Services. After considerable discussion the Committee decided to recommend that the Medical Plan should contain provision for the building of a Sanatorium to include an Orthopædic section and that the present item should be deleted. We therefore asked for rough estimates to be prepared of the cost of such a hospital and these are set out in Appendix *E* to this Report. We accept these tentative estimates and recommend that this item, at a cost of \$2,217,000, should be substituted for the present item at a cost of \$1,100,000. In recommending the inclusion of this item in the Medical Plan we desire, however, to emphasise that it is not our intention that this should be a substitute for other measures in the fight against tuberculosis, namely the extension of Tan Tock Seng in the Medical Plan and the provision of other facilities in the ordinary Medical, Social Welfare and Education Departments' budgets. Tuberculosis, we are convinced, is a gigantic problem which can only be attacked successfully if attacked at every angle simultaneously, namely by better housing conditions, better feeding, school medical services, infant welfare, home treatment, etc. We therefore wish to state clearly that this item is recommended as an additional unit in the fight and not in substitution of those other methods of attack which we have outlined.

11. EXTENSION OF TAN TOCK SENG HOSPITAL

This item is shown in the Medical Plan as requiring \$1½ millions. In Committee the Director of Medical Services asked for a reconsideration of the original scheme to enable the question of quarters to be tackled satisfactorily. The Plan envisages that the whole of the 800 beds at Tan Tock Seng Hospital should be devoted to use as a hospital-clinic for the treatment of Tuberculosis. A revised breakdown of estimates was produced to and examined by the Committee and is attached to this Report as Appendix *F*. It will be seen that the major part of the work is the provision of quarters. The Committee examined these proposals in detail and approved them. We therefore recommend that this item should stand in the Plan and that the estimate should be revised from \$1,758,000 to \$2,800,000.

12. RURAL LABOURERS' LINES

It was represented to the Committee that out of a total force of rural health labourers of 776, only 25 per cent were housed. We were informed that it is expected that the figure of 776 will remain fairly constant. The Committee were unanimously of the opinion that it should be an integral part of the Medical Plan to provide accommodation for all such labourers over a period of years. We also consider that quarters should be provided for Sanitary Inspectors, Technical Subordinates and other officers who are required to live in the area they serve. Revised estimates show a reduction on the original estimate of \$2 millions for labourers' quarters of \$400,000 to \$1,600,000. If, however, the recommendation is accepted to provide quarters for Sanitary Inspectors and Technical Subordinates, a further amount of \$670,000 will be necessary, making \$2,270,000 in all.

We also consider that the description of this item should be changed to 'Health Department Housing'.

13. ANTI-MALARIA WORK

It was explained that this item cannot at present be allocated to any particular work, but is an attempt to make an intelligent forecast of special capital work which will be required in the future. Maintenance of present anti-malarial works is well-looked after by annual provision.

Although not an urgent matter, the Committee considered that the item should have a place in the Medical Plan if the picture of the future needs was to be correct. We therefore recommend its inclusion.

14. DISTRICT HOSPITALS

In view of the revision of item 3 relating to the General Hospital to provide for 1,500 beds instead of 1,000 beds as in the original 1947 Plan, and of the opinion expressed to us that patients generally preferred to go a longer distance to one good central hospital rather than a shorter distance to a secondary hospital, and of the desirability of waiting to see how the expansion of the town areas of Singapore might affect this problem, it was agreed that this item should be deleted from the Plan, but with a recommendation that the matter should be re-considered in a few years' time. This recommendation effects a reduction of \$11 millions.

15. EXPANSION OF INFECTIOUS DISEASES HOSPITAL

The Director of Medical Services explained that a Special Committee was being formed to consider this problem, jointly with the Municipal Health authorities. For these reasons it was agreed that until the problem was more fully resolved this item could be omitted from the Plan.

16. MENTAL HOSPITAL IMPROVEMENTS

Before the war there were 1,800 patients in this hospital. The number was considerably fewer now owing largely to the callous attitude adopted by the Japanese towards this type of infirmity. The Committee supports the Director of Medical Services in considering that planning on the basis of a population of 2,000 inmates was reasonable. The Committee also agreed that provision should be made for recreational facilities. A revised estimate of cost was produced to the Committee and is attached as Appendix G to this Report. We recommend that this item be included in the Plan and that the estimated provision be increased from \$1,880,000 to \$3 millions.

17. ADDITIONAL ITEM

In the course of its discussions the Committee was asked to consider an additional item not appearing in the Plan contained in Council Paper No. 4 of 1948. This is a proposal by the Director of Medical Services to establish a Mental Defectives Home to house 150 low-grade defective and feeble-minded children who, without proper care and control, are liable to become a danger to public peace and morality. These children cannot be dealt with in the same way as adults, nor is their problem the same as that connected with handicapped children who, apart from their physical infirmities, are mentally normal. The proposal has the complete support of this Committee, and an item of \$1 million has been entered in the Plan which we now recommend. A breakdown of the Estimates for this item is contained in Appendix H. The question of the site for this Home was discussed at length, and it was agreed that the Home should be separate and distinct from the Mental Hospital and that it should be constructed in an area which made this distinction clear, even though it may be necessary to acquire land for the purpose.

7. The Committee endorses the opinion expressed in paragraph 3 of the Report of the Committee which assisted the Director of Medical Services (Annexure *B* to the Plan) that a ten-year period should be the maximum in which the proposals contained in this Plan should be completed. We have been much impressed by the medical needs of the Colony, and therefore strongly recommend that the revised Plan which we have prepared and attach as Appendix *I* to this Report should be approved, and that it should be carried out within the period of ten years into which we have fitted it.

It will be seen that the Plan we recommend for adoption is expected to cost about \$33 millions compared with about \$50 millions as set out in the original Plan. The reasons for this are mentioned at their appropriate places in this Report, but we may summarise the main reasons briefly and approximately as follows:—

- (a) a saving on estimates for the General Hospital of \$6 millions;
- (b) a saving of \$2 $\frac{3}{4}$ millions on the proposals for the Venereal Diseases Hospital;
- (c) a saving of \$250,000 on the Medical Store;
- (d) a saving of \$11 millions on the proposals for District Hospitals;
- (e) a saving of \$1 $\frac{1}{2}$ millions on the proposals for Infectious Diseases.

Against these savings, however, there has to be set additional expenditure in connection with the Tuberculosis Sanatorium (\$1,000,000); extension at Tan Tock Seng (\$1,000,000); Health Department Housing (\$750,000); Mental Hospital improvements (\$1,000,000) and the Home for Mentally Defective Children (\$1,000,000).

In this connection we wish to emphasise two things. Firstly, some of the 'saved' items may have to be considered again at a later date; secondly, the figures given are not firm estimates. It would have been impossible for the work of this Committee to have been completed for a very long time if final lay-outs had had to be decided and final plans prepared. When this is done, some variations from the estimates given must be expected.

8. In conclusion we desire to record our thanks to our Secretary (Mrs. D. Alexander) for the able way in which she carried out her duties.

A. WILLIAMS, *Chairman*.

M. J. NAMAZIE.

C. C. TAN.

P. F. de SOUZA.

LIM YEW HOCK.

SINGAPORE. 12th September, 1948.

SINGAPORE GENERAL HOSPITAL

Alterations to Existing Buildings:—

			\$	\$
Additional Storey over Ward 4	...	...	265,000	
Additional Storey over Ward 5	...	...	265,000	
New Theatre block	...	...	300,000	
Air Conditioning for above	...	...	60,000	
Two new lifts and one shaft	...	...	47,000	
Electrical work to foregoing	...	...	66,000	
				1,003,000
Alterations to existing Ward 1	...	...		20,000
Alterations to existing Ward 7	...	...		20,000
Alterations to existing Ward 10	...	...		20,000
Alterations to existing Ward 11	...	...		20,000
Alterations to X-Ray Therapy and Theatres A and B	...	...		10,000
Additional Storey over Ward 17	...	...		300,000
Electrical work to last	...	...		22,500
Lift and Shaft to existing Theatre	...	...		27,000
Re-design Ward 14	...	...		25,000
Demolition of old buildings	...	...		40,000

New Works:—

Pathological Laboratory	...	...	350,000	
Piling	...	...	70,000	
				420,000
Out-patients Department	...	...		185,000
Children's 200 bed Wards	...	...		580,000
Laundry building	...	...	125,000	
Equipment	...	...	225,000	
				350,000
New Kitchens	...	...		100,000

Hospital Quarters:—

M.O's quarters 27 numbers at \$40,000	...	...		1,080,000
M.O's flats 34 numbers at \$35,000	...	...		1,290,000
Sisters and Matrons quarters—83 suites+6 rooms	...	...		800,000
Nurses hostel—110 rooms+10 Air Conditioned rooms	...	...		800,000
Hospital servants 323 quarters (2 room units) (if single room units \$1,250,000)	...	...		1,400,000
Laboratory Assistants and Dental Mechanics 20 single at \$5,500 +20 married at \$15,000	...	...		410,000
15 garages and 12 quarters	...	...		70,000
Site Formation	...	...		50,000
Roads	...	...		200,000
Modernisation of electrical mains and substation	...	...		200,000
Modernisation of water supply	...	...		500,000
New Sewers	...	...		100,000
Acquisition of Land (not known)	...	...

Total ... 10,042,500

APPENDIX B

KANDANG KERBAU HOSPITAL

Existing Administration Block:—

	\$
Three floors to be converted to provide 32 3rd class Ante Natal beds, Septic labour Room, 27 3rd class labour beds, creche and 48 3rd class maternity beds plus additional lavatory accommodation ...	60,000
Additional Storey to provide 64 3rd class maternity beds ...	200,000
Existing Out-patients Department converted to Nurses Quarters ...	10,000
Existing Maternity Block—converted to provide six 36 bed wards and extra lavatory accommodation ...	40,000
Electrical Work ...	11,000

New Building:—

Labour Wards for 3 1st Class 6 2nd Class and 27 3rd Class patients	
Maternity Wards for 25 1st Class and 50 2nd Class patients	
Gynæcology Wards for 10 1st Class 27 2nd Class and 50 3rd Class patients	
Theatres—One Large One Septic	
Kitchen and Stores—	
Administration—	
Out-patients—3 Departments	
Path. Laboratory, Dispensary	
X-ray Room, Admission, Almoner's Office	
Secretary, Clerical Staff, Steward, Stores	
Matrons' Room ...	1,038,000
Electrical Work on New Hospital Building ...	95,000

Quarters:—

(1) Hospital Servants 360 Midwives 60	
420 two room units ...	1,856,000
(2) M.O's quarters—12 numbers at \$40,000 ...	480,000
(3) Hospital Assistants—10 married at \$15,000 and 4 single at \$5,000 ...	172,000
(4) Sisters and Nurses quarters:—	
Sisters 24	
Matrons 4	
Nurses 28 suites plus 2 air conditioned rooms ...	225,000
75 single rooms	
52 double rooms plus 6 air conditioned rooms ...	953,850
(5) Five Garages and nine syces quarters ...	25,000

Ancillary Works:—

Piled foundations to all new buildings ...	945,000
Sewers to new building ...	50,000
Water supply to new building ...	8,000
Roads and two new bridges—Roads ...	\$70,000
Bridges ...	\$20,000
Fences ...	90,000
Acquisition of Land (not known) ...	6,000

Contingencies ... 6,264,850
335,150

Total ... 6,600,000

KANDANG KERBAU HOSPITAL

SCHEDULE OF PROPOSED ACCOMMODATION

Existing Administration Block—				<i>Beds</i>	<i>Beds</i>
Ground Floor—					
3rd Class Antenatal:					
Two 8 bed wards	...	...	...	16	
One 16 bed ward	...	...	...	16	
				<hr/>	32
A Septic Labour Room:					
First Floor—					
3rd Class Labour:					
Three 9 bed wards	...	...	...		27
Creche					
Second Floor—					
3rd Class Maternity:					
One 24 bed ward	...	...	...	24	
One 9 bed ward	...	...	...	9	
One 8 bed ward	...	...	...	8	
One 4 bed ward	...	...	...	4	
One 3 bed ward	...	...	...	3	
				<hr/>	48
Additional Storey (new)—					
3rd Class Maternity:					
Two 32 bed wards	...	...	...		64
Existing Maternity Block—					
Six 36 bed wards	...	...	...		216
					<hr/>
Total 3rd Class ...					387
New Building—					
Second Class Maternity—					
Ten 5 bed wards	...	...	...	50	
Second Class Labour—					
Three 2 bed wards	...	...	...	6	
				<hr/>	56
First Class Maternity—					
Nine double wards	...	...	18 beds		
Seven single wards	...	...	7 beds		
				25	
Labour—Three Single Units ...				3	
				<hr/>	28
Isolation (all Classes)—					
Thirty cubicles	...	...	...		30
Gynæcology—					
3rd Class—five 10 bed wards	...	...	50		
2nd Class—three 9 bed wards	...	...	27		
1st Class—ten single bed wards	...	...	10		
				<hr/>	87
Total ...					<hr/>
					588

SUMMARY

Class	Antenatal	Maternity	Labour	Gynæcology	Total	Isolation
1st ..	..	25	3	10	38	} 30
2nd ..	..	50	6	27	83	
3rd ..	32	328	27	50	437	
Total ..	32	403	36	87	558 + 30 = 588	

APPENDIX D

VENEREAL DISEASES HOSPITAL

Conversion of existing Venereal Diseases Hospital
at Middle Road to accommodate 120 beds

Existing Buildings:—		\$	\$
Alterations and additions to three existing buildings ...			100,000
New Buildings:—			
Chief Medical Officer's House 1	40,000		
Quarters for Medical Officers 5	175,000		
Quarters for Sisters, Supervisor, Laboratory Assistants, Hospital Assistants and Clerks 42	630,000		
Quarters for Nurses and Female Clerks 33	264,000		
Quarters for Hospital Servants 46	200,000		
Garages for 4 Ambulances	10,000		
Ancillaries	91,000		
			1,410,000
Clinic:—			
Building for Clinic	80,000		
Quarters for Medical Officers 2	70,000		
Quarters for Hospital Assistants 6	90,000		
			240,000
		Total ...	1,175,000

NEW 300 BED T.B. HOSPITAL NEAR BEDOK—

PRELIMINARY ESTIMATE OF COST

	\$	\$
Hospital:—		
Three two storey Ward Blocks each of 100 beds at \$280,000 ...		840,000
Administration block single storey ...		70,000
Kitchen block single storey ...		60,000
Covered ways ...		5,000
Electrical work ...		77,500
Quarters:—		
Senior M.O. ...	45,000	
2 A.M.Os. at \$35,000 ...	70,000	
1 Matrons quarters ...	35,000	
5 Sisters quarters ...	40,000	
35 Nurses quarters ...	270,000	
6 Hospital Assistants quarters ...	42,000	
8 Cooks, 80 Ward Staff, 10 Kebuns, 10 Artisans—Total 108 quarters	370,000	
		872,000
Ancillary Works:—		
Roads say one mile ...		47,500
Sewer and disposal plant ...		30,000
Water Supply ...		25,000
Site Formation ...		40,000
Contingencies ...		150,000
	Total ...	2,217,000

TAN TOCK SENG HOSPITAL

Improvements:—

	\$
Modern Sanitation to existing Mandalay Road Hospital and quarters ...	97,000
Re-roofing 18 wards and covered ways with asbestos, replacing corrugated iron ...	113,000
Quarters:—	
Medical Officers Quarters—	
Extensive repairs to five existing, new quarters 3 numbers ...	200,000
Sisters quarters—	
Ten Sisters plus one Almoner—11 suites ...	88,000
Nurses quarters—	
Hostel for 60 Nurses (if Students' Hostel available no expenditure required on this item) ...	300,000
Hospital Assistants quarters—	
Extensive repairs to 19 married quarters ...	95,000
Extensive repairs to 12 single quarters ...	18,000
Extensive repairs to Bachelors Mess 12 ...	10,000
New married quarters for 31 families ...	465,000
New single quarters for six single ...	33,000
Hospital Servants quarters—	
New quarters for 172 families ...	745,000
New quarters for 88 single ...	340,000
Ancillary Works:—	
Water Supply ...	30,000
Sanitation ...	75,000
Site formation ...	47,000
Roads (say one mile) ...	20,000
	2,676,000
Contingencies ...	124,000
Total ...	2,800,000

MENTAL HOSPITAL

APPENDIX G

					\$	\$
Essential Works—						
Two 50 bed wards	...	...	...	...	225,000	
Pantry to each ward	...	...	...	...	30,000	
Two T.B. wards	...	...	...	...	125,000	
Cold room of 1,000 cubic feet	...	...	...	...	10,000	
New boiler house and move existing boilers, etc.	...	...	...	...	9,000	
Clerk and Stewards stores	...	...	...	...	100,000	
Garage, two vehicles and quarters for two drivers	...	...	...	...	12,000	
Quarters—						
2 M.Os. at \$40,000	...	...	...	...	80,000	
6 Nursing Sisters and Matron	...	...	...	...	60,000	
12 Hospital Assistants or similar	...	...	...	...	120,000	
320 Hospital Servants	...	...	...	...	1,393,000	
32 Local Nurses	...	...	...	...	256,000	
4 Male Nurses	...	...	...	...	80,000	
						2,500,000
Desirable Works—						
Modernisation of wards	...	...	...	...	120,000	
Two rooms for visitors	...	...	...	...	12,000	
Renovation of Male Workers Dining Room	...	...	...	...	2,250	
Store for farm implements, etc.	...	...	...	...	17,300	
Occupational Therapy	...	...	...	...	85,000	
Central recreation hall	...	...	...	...	80,000	
Work on Kitchens	...	...	...	...	10,000	
Gate Lodge	...	...	...	...	3,500	
Day rooms to two wards	...	...	...	...	30,000	
Airing Court to one female ward	...	...	...	...	1,000	
						361,050
				Contingencies say	...	138,950
				Total	...	3,000,000

APPENDIX H

HOME FOR MENTALLY DEFECTIVE CHILDREN

						\$
150 bedded children's wards	...	...	...	...	...	435,000
Quarters for Medical Officer 1	...	...	...	...	...	40,000
Quarters for one Matron and five Sisters	...	...	...	...	...	50,000
Quarters for one Steward and two Hospital Assistants	...	...	...	...	...	45,000
Quarters for Hospital Servants 80	...	...	...	...	...	345,000
Ancillaries	...	...	...	...	...	85,000
				Total	...	1,000,000

APPENDIX I
MEDICAL PLAN

Institution	1949	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	9th year	10th year	Total
1. Base Medical Store Pharmacy School and Essential Manufactory ..	145,000	152,000	153,000	..	..	..	..	..	..	..	..	450,000
2. Leper Settlement ..	114,000	114,000	200,000	200,000	152,000	..	..	..	..	..	..	780,000
3. General Hospital ..	..	760,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,282,000	10,042,000
4. Kandang Kerbau Hospital ..	..	587,000	587,000	500,000	500,000	500,000	750,000	1,000,000	1,000,000	1,076,000	100,000	6,600,000
5. Rural Clinics and Dispensaries ..	82,000	90,000	90,000	90,000	90,000	90,000	110,000	110,000	32,000	..	..	784,000
6. St. John's Island Water Supply ..	..	..	..	250,000	..	..	..	..	..	..	..	250,000
7. Medical and Dental School Clinic ..	..	215,000	..	..	..	..	..	..	..	..	..	215,000
8. Sea and Air Ports ..	..	..	200,000	200,000	100,000	100,000	72,000	150,000	..	..	..	822,000
9. Venereal Diseases Hospital ..	..	..	250,000	250,000	250,000	250,000	250,000	250,000	250,000	..	..	1,750,000
10. T.B. Sanatorium ..	..	..	750,000	750,000	500,000	217,000	..	..	..	..	..	2,217,000
11. Tan Tock Seng Hospital ..	..	288,000	250,000	250,000	250,000	500,000	500,000	500,000	..	262,000	..	2,800,000
12. Health Department Housing (\$100,000 (1948)) ..	100,000	100,000	100,000	200,000	200,000	200,000	200,000	300,000	300,000	200,000	370,000	2,270,000
13. Anti-Malarial ..	..	..	..	..	..	50,000	50,000	50,000	50,000	100,000	200,000	500,000
14. Mental Hospital ..	..	60,000	140,000	100,000	100,000	100,000	500,000	500,000	500,000	500,000	500,000	3,000,000
15. Mental Defectives ..	..	..	..	200,000	200,000	200,000	200,000	200,000	..	..	..	1,000,000
Total Capital Expenditure ..	441,000	2,366,000	3,720,000	3,990,000	3,342,000	3,207,000	3,632,000	4,060,000	3,132,000	3,138,000	2,452,000	33,480,000
Approximate Annual Increase above present Annually Recurrent Expenditure	..	250,000	500,000	1,000,000	1,500,000	2,000,000	2,750,000	3,000,000	3,750,000	4,000,000	4,000,000	Expected annual increase in recurrent expenditure on completion of Plan—4 millions.

APPENDIX II

FINANCIAL STATEMENT FOR 1950

(a) RECEIPTS

<i>Hospital Fees, etc.</i>	<i>Medical General and Health</i>	<i>Total</i>
\$729,629.98	\$262,033.32	\$991,663.30

(b) PAYMENTS

	Medical General	Hospitals and Dispensaries	Health Branch	Social Hygiene Branch	General Clerical Service	Government Medical Store	Total
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Personal Emoluments ..	1,100,132 92	1,267,070 80	351,695 39	72,786 35	143,704 46	35,867 99	2,971,257 91
Other Charges ..	20,069 36	3,825,043 55	414,576 04	109,169 11	..	642,896 32	5,011,754 38
Special Expenditure ..	58,758 01	135,161 39	76,067 19	13,115 25	..	18,296 01	301,397 85
Total ..	1,178,960 29	5,227,275 74	842,338 62	195,070 71	143,704 46	697,060 32	8,284,410 14

Notes:—(1) Payments include Contribution to Tan Tock Seng Committee.
 (2) Above statement also includes cost of Indents on Crown Agents.

APPENDIX III

ANTI-MALARIAL WORKS CARRIED OUT IN THE YEAR 1950

Locality	MATERIALS USED						WORK DONE						
	Subsoil Pipes	Channels	Slabs	Bricks	Cement	A. M. Oil	NO. OF YARDS OF DRAIN MAINTAINED		No. of Yards of sub-soil pipes laid	NO. OF YARDS OF OPEN DRAIN CONSTRUCTED		NO. OF YARDS OF OPEN DRAIN REPAIRED	No. of Yards of sub-soil pipes repaired
							Earth	Concrete		Earth	Concrete		
Pasir Panjang	945	740	1,060	1,900	102	4,800	18,448	1,220	384	..	522	310	276
Bukit Timah	820	232	241	6,710	139	10,357	26,372	38,543	285	..	90	607	618
Bukit Panjang	2,760	296	416	2,480	71	4,984	..	22,650	902	..	450	3,300	530
Serangoon	844	636	391	5,800	169	7,295	360,105	53,893	34	4,632	281	1,566	4,438
Sembawang	660	78	215	1,935	41	2,319	87,073	3,435	16	295	..	79	272
Bedok ..	..	544	529	980	48	7,804	151,178	73,460	..	568	534	420	..
Changi ..	2,175	422	727	1,650	78	2,764	6,148	2,055	875	..	375	507	305
Town ..	1,600	50	40	1,000	60	..	..	..	530	..	10	40	..
Total ..	9,804	2,998	3,619	22,455	708	40,323	649,324	195,256	3,026	5,495	2,262	6,829	6,439

APPENDIX IV

SUMMARY OF WORK CARRIED OUT BY DISTRICT SANITARY INSPECTORS
DURING 1950

I. INFECTIOUS DISEASES AND DISINFECTIONS

Number of cases of Plague	...	...	...	...	—
Number of cases of Small-pox	...	...	...	...	—
Number of cases of Cholera	...	...	...	...	—
Number of cases of Diphtheria	...	...	...	...	49
Number of cases of Measles	...	...	...	...	—
Number of cases of Enteric Fever	...	...	...	...	21
Number of cases of Chicken pox	...	...	...	...	71
Number of cases of Yellow Fever	...	...	...	...	—
Number of cases of Typhus	...	...	...	...	5
Number of cases of Poliomyelitis	...	...	...	...	25
Number of cases of Leprosy	...	...	...	...	81
Number of cases of Tuberculosis	...	...	...	...	631

II. INSPECTION AND SANITATION

Number of inspections, house to house	...	...	...	16,458
Number of inspections, Police Stations	...	...	...	478
Number of inspections, Schools	...	...	...	1,520
Number of inspections, Government buildings	...	...	...	1,507
Number of buildings with insanitary latrines	...	...	...	1,829
Number of buildings with insanitary urinals	...	...	...	263
Number of latrines inspected	...	...	...	15,380
Number of recommended reconstruction	...	...	...	1,548
Number of latrines abolished	...	...	...	380
Number of latrines constructed or reconstructed	...	...	...	754
Number of bored hole latrines constructed	...	...	...	8
Number of night-soil pails on removal list	...	...	...	6,150
Daily average amount of refuse in cubic feet	...	...	...	2,684
Number of village incinerators serviceable	...	...	...	13
Number of village incinerators unserviceable	...	...	...	2
Number of buildings with inadequate drainage	...	...	...	958
Number of linear yards drains cleared daily	...	...	...	17,407
Number of linear yards new earth drains dug	...	...	...	5,152
Number of linear yards masonry drains constructed	...	...	...	897
Number of linear yards masonry drains repaired	...	...	...	817
Number of linear yards subsoil drains constructed	...	...	...	1,781
Number of linear yards subsoil drains repaired	...	...	...	581

III. BUILDINGS

Number of permits issued	...	...	...	251
Number of permits rejected	...	...	...	3
Number of plans passed	...	...	...	190
Number of plans approved conditionally	...	...	...	83
Number of plans rejected	...	...	...	1
Number of new buildings erected	...	...	...	149
Number of buildings reconstructed	...	...	...	71
Number of buildings condemned	...	...	...	13
Number of buildings demolished	...	...	...	11

IV. FACTORIES, WORKSHOPS AND OFFENSIVE TRADES

Number of premises inspected	4,811
------------------------------	-----	-----	-----	-----	-------

V. FOOD

Eating Houses	...	...	...	...	9,248
Coffee Shops	...	...	...	...	1,772
Butcher Shops and Slaughter	...	...	...	...	386
Fishmongers	...	...	...	...	2,725
Grocers	...	...	...	...	4,034
Markets	...	...	...	...	2,603
Milk Vendors	...	...	...	...	1,525
Bake-Houses	...	...	...	...	1,538
Hawkers	...	...	...	...	5,231
Total Inspections					29,062

VI. KEEPING OF ANIMALS

Cowsheds	...	...	...	...	1,251
Piggeries	...	...	...	...	3,798
Goat Pens	...	...	...	...	12
Total Inspections					5,061

Nuisances in Cowsheds	...	...	...	...	78
Nuisances in Piggeries	...	...	...	...	1,954
Goat Pens	...	...	...	...	11

VII. GENERAL

Water—Number of samples taken for examination from wells, etc.	...	...	...	...	45
Rats—Number of rats submitted for examination	...	...	...	...	351
Complaints—Number received	...	...	...	...	255
Interviews with agents and owners	...	...	...	...	7,275
Number of Intimation notices served	...	...	...	...	1,422
Number complied with	...	...	...	...	1,239
Number of nuisances notices served	...	...	...	...	464
Number complied with	...	...	...	...	351
Number of anti-mosquito notices served	...	...	...	...	214
Number complied with	...	...	...	...	179
Number of new lepers discovered	...	...	...	...	30

VIII. PROSECUTIONS

Total number	...	...	...	...	102
Results of prosecutions (Total fines)	...	...	...	...	\$3,519.50

APPENDIX V

ST. JOHN'S ISLAND, QUARANTINE STATION

FIGURES FOR THE YEAR 1950

Total passengers admitted during the year	...	...	...	8,658
Greatest number admitted on any one day (17th September, 1950)	...	...	...	804
Maximum number in residence on any one day (18th September, 1950)	...	...	...	865
Minimum number in residence on any one day	...	...	...	1
(a) Total deaths during the year in hospital	...	...	...	1
(b) Total deaths prior to admission to hospital	...	...	...	—
Death rate per mille amongst passengers admitted	...	...	...	—
Number of Municipal Contact admitted	...	...	...	—
Number of Government Contact admitted (Attendant on Small-pox Case)	...	...	...	1
Number of Municipal Contacts who developed infectious diseases on the island	...	...	...	—
Number of Government Contacts who developed infectious diseases on the island (Typhoid)	...	...	...	1
Number of gallons of Singapore water provided	...	...	...	8,296,288
Average stay of contacts (days)	...	...	...	2.1
Passengers are divided into:—				
Chinese	...	...	...	4,640
Northern Indian	...	...	...	1,356
Southern Indian	...	...	...	2,246
Malays and Indonesian	...	...	...	379
Eurasian	...	...	...	3
Others	...	...	...	34
Total	...	...	...	8,658

There was an average of 116 detainees daily on the Island for period January to December, 1950. In addition there were one Officer and 29 sub-warders stationed here.

HOSPITAL, ST. JOHN'S ISLAND

Total number of cases treated (11 patients are staff, etc.)	...	...	21
Total number of cases Deaths in hospital	...	...	1
Remaining at the end of the year 1949	...	...	—
	<i>Male</i>	<i>Female</i>	
Cured	11	5	
Improved	3	—	
Death	—	1	
Transferred to T.T.S.H. (Male)	...	...	1
Remaining at the end of 31st December, 1950	...	...	—
Average daily number of patients in the hospital	...	...	0.07%
Total number of cases of C.S.M. admitted	...	...	—
Total number of vaccination done (Passengers)	...	...	6,486
Total number of vaccination done (Staff, etc.)	...	...	—
Total number of vaccination done (Detainees)	...	...	—
Total number of re-vaccination done (Passengers)	...	...	—
Total number of re-vaccination done (Staff, etc.)	...	...	350
Total number of re-vaccination done (Detainees)	...	...	89
Total number of Anti-Cholera inoculation done (Passengers)	...	...	—
Total number of Anti-Cholera inoculation done (Staff, etc.)	...	...	—
Total number of Anti-Cholera inoculation done (Detainees)	...	...	—
Total number of new cases treated out-door (Passengers)	...	...	194
Total number of new cases treated out-door (Staff, etc.)	...	...	358
Total number of new cases treated out-door (Detainees)	...	...	480
Total number of attendances (Passengers)	...	...	274
Total number of attendances (Staff, etc.)	...	...	662
Total number of attendances (Detainees)	...	...	1,604
Total number of Venereal Diseases out-door (Passengers)	...	...	1
Total number of Venereal Diseases out-door (Staff, etc.)	...	...	2
Total number of Venereal Diseases out-door (Detainees)	...	...	14
Total number of Birth in Hospital (Passengers)	...	...	1
Total number of Birth not in Hospital (Staff, etc.)	...	...	19
Total number of Death in Hospital (Staff, etc.)	...	...	1
Total number of Death not in Hospital (Staff, etc.)	...	...	4

APPENDIX VI

IN-PATIENTS-ALL HOSPITALS FOR THE YEAR 1950

The following table shows the hospitals maintained by the Medical Department, Singapore, the daily average number of patients in each, the number of patients admitted during the year, the total number of patients treated, the number of deaths and the death rate per hundred treated. (The Quarantine Hospital and Leper Settlement are not included.)

Hospitals	Average daily No. of Patients	Admissions during the Year	CASES TREATED DURING THE YEAR			Deaths	Mortality per cent
			Male	Female	Total		
General Hospital	642.46	17,886	12,949	5,523	18,472	2,372	12.84
T. T. S. H. (T. B. and General) ..	515.44	1,526	1,679	376	2,055	220	10.71
K. K. (Maternity and Gynaecology) ..	211.00	16,691	..	16,883	16,883	80	.47
Police Head Quarters	7.90	816	825	..	825	..	..
Prison Outram	34.00	628	669	..	669	7	1.05
„ Changi	11.49	266	280	..	280	..	..
Woodbridge Hospital	1,081.00	652	990	670	1,660	57	3.43
St. Andrew's Orthopaedic Hospital ..	68.25	47	64	45	109	3	2.75
Social Hygiene	54.00	2,555	2,165	452	2,617	14	.53
Middleton Hospital	54.00	1,771	1,121	674	1,795	70	3.90
Total ..	..	42,838	20,742	24,623	45,365	2,823	6.22

N. B.:—Total Cases Treated in 1949 : 40,976.

APPENDIX VII

HOSPITALS, COLONY OF SINGAPORE, IN-PATIENTS*

RETURN OF DISEASES AND DEATHS FOR THE YEAR, 1950

Diseases	†Remaining at end of 1949	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1950	Remarks
		Admis- sions	Deaths			
I.—Infectious and Parasitic Diseases						
1. Typhoid fever	3	157	22	160	3	
2. Paratyphoid fever .. ..	..	..	..	..	..
3. Typhus:—						
(1) Tropical typhus undifferentiated .. ..	..	11	..	11	..	
(2) Tropical typhus 'x 19' (or W or Urban) .. ..	..	9	..	9	..	
(3) Tropical typhus 'K' (or rural), or Tsutsugamushi fever	1	6	1	7	..	
(4) Other rickettsia infections .. ..	..	..	..	..	..
4. Relapsing fever .. ..	..	..	..	..	..
5. Undulant fever .. ..	..	..	..	..	..
6. Small-pox .. ..	..	..	..	..	..
7. Measles .. ..	..	55	1	55	..	
8. Scarlet fever .. ..	..	..	..	..	..
9. Whooping cough .. ..	..	35	1	35	2	
10. Diphtheria	8	272	31	280	29	
11. Influenza	5	199	1	204	3	
12. Cholera .. ..	..	..	..	..	..
13. Dysentery:—						
(1) Amœbic	3	124	13	127	6	
(2) Bacillary .. ..	..	31	2	31	1	
(3) Mixed .. ..	..	..	..	..	..
(4) Undefined or due to other causes .. ..	..	30	1	30	..	
14. Plague:—						
(1) Bubonic .. ..	..	..	..	..	..
(2) Pneumonic .. ..	..	..	..	..	..
(3) Septicæmic .. ..	..	..	..	..	..
(4) Undefined .. ..	..	..	..	..	..
15. Erysipelas .. ..	..	17	1	17	..	
16. Acute poliomyelitis or polioencephalitis	5	82	10	87	45	
17. Encephalitis lethargica .. ..	..	..	..	..	..
18. Cerebro-spinal fever .. ..	..	10	4	10	..	
19. Glanders .. ..	..	..	..	..	..
20. Anthrax .. ..	..	..	..	..	..
21. Rabies .. ..	..	..	..	..	..
22. Tetanus:—						
(1) Tetanus of the newly born .. ..	..	30	26	30	1	
(2) Other forms of tetanus	2	46	20	48	2	
23. Tuberculosis of the respiratory system	446	1,715	257	2,161	422	
Carried forward ..	473	2,829	391	3,302	514	

The form shows in the main the arrangement of diseases in the *International Nomenclature*, 1931 Edition. To save space the unimportant diseases of any class can be grouped in their places as 'Other Diseases' of the Class.

*Excluding cases in Leper Settlement.

†i.e. the year previous to that for which the return is made.

‡'Total cases treated' will, of course, include those remaining in Hospital at the end of the previous year.

§The figures in this column to be carried on to the next year's Return.

APPENDIX VII—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR, 1950—continued

Diseases	*Remaining at end of 1949	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1950	Remarks
		Admis- sions	Deaths			
<i>Brought forward</i> ..	473	2,829	391	3,302	514	
<i>I.—Infectious and Parasitic Diseases</i> <i>—(contd.)</i>						
24. Tuberculosis of the central nervous system	6	170	139	176	5	
25. Tuberculosis of the intestines or peritoneum .. .. .	..	26	10	26	1	
26. Tuberculosis of the vertebral column	26	90	9	116	38	
27. Tuberculosis of other bones and joints	63	60	2	123	55	
28. Tuberculosis of the skin or subcuta- neous tissue (Lupus) .. .. .	..	2	..	2	..	
29. Tuberculosis of the lymphatic system (abdominal and bronchial glands excepted)	4	27	1	31	..	
30. Tuberculosis of the genito-urinary system .. .. .	..	..	..	..	..
31. Tuberculosis of other organs .. .. .	..	22	4	22	2	
32. Tuberculosis disseminated	3	15	5	18	4	
33. Leprosy	3	47	35	50	..	
34. Syphilis (also see 35 (7):—	1	17	..	18	..	
(1) Primary	4	104	..	108	3	
(2) Secondary	5	270	1	275	9	
(3) Tertiary	6	199	..	205	8	
(4) Hereditary	13	202	19	215	4	
(5) Period not indicated	20	677	9	697	14	
35. Other venereal diseases:—						
(1) Soft chancre	1	33	..	34	..	
(2) Gonorrhœa	4	335	..	339	1	
(3) Gonorrhœal ophthalmia	1	97	..	98	1	
(4) Other gonorrhœal complica- tions	5	100	..	105	6	
(5) Granuloma venereum .. .. .	..	619	3	619	5	
(Non VD) .. .. .	..	..	..	..	..
(6) Tropical bubo (Lymphogranu- loma inguinale)	1	35	1	36	..	
(7) Mixed venereal infections	1	65	..	66	..	
36. Purulent infective septicæmia or Pyæmia	1	50	40	51	1	
37. Yellow fever .. .. .	..	..	..	..	..
38. Malaria:—						
(1) Tertian (Benign) .. .. .	..	28	..	28	..	
(2) Quartan .. .. .	..	2	..	2	..	
(3) Aestivo-autumnal (Subtertian)	3	118	17	121	3	
(4) Mixed infections	1	1	..	2	1	
(5) Unclassified .. .. .	..	123	..	123	..	
(6) Cachexia	1	1	1	2	..	
(7) Blackwater fever .. .. .	..	2	..	2	..	
39. Other diseases due to Protozoa:—						
(1) Yaws (frambæsia) .. .. .	..	6	..	6	..	
(2) Spirochaetosis icterohæmorrhæ- gica .. .. .	..	19	3	19	..	
<i>Carried forward</i> ..	646	6,391	690	7,037	675	

APPENDIX VII—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR, 1950—continued

Diseases		*Remaining at end of 1949	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1950	Remarks
			Admis- sions	Deaths			
Brought forward ..		646	6,391	690	7,037	675	
I.—Infectious and Parasitic Diseases —(contd.)							
(3) Leishmaniasis (dermal) ..		..	..	..	..	..
(4) Kala azar ..		..	2	..	2	..	
(5) Other diseases ..		4	5	..	9	..	
40. See 42 (6) ..		..	..	..	..	..
41. See 42 (3) ..		..	..	..	..	..
42. Other diseases due to Helminths:—							
Cestodes							
(1) Tænia solium ..		..	2	..	2	..	
(2) Tænia saginata ..		..	..	..	..	..
(3) Other cestodes, including hydatid cyst ..		..	..	..	..	..
Nematodes							
(4) Filaria ..		..	25	..	25	..	
(5) Ascaris ..		4	95	5	99	1	
(6) Ankylostoma ..		2	88	1	90	..	
(7) Oxyuris vermicularis ..		..	1	..	1	..	
(8) Dracunculus medinensis ..		..	..	..	..	..
Trematodes							
(9) Schistosomum japonicum ..		..	..	..	..	..
(10) Clonorchis sinensis ..		..	..	..	..	..
(11) Other helminths ..		..	13	..	13	..	
43.—(1) Sprue ..		..	2	..	2	..	
(2) Actinomycosis ..		..	3	1	3	..	
(3) Other mycotic infections exclud- ing purely dermal mycosis ..		..	..	..	..	..
44. Other infectious or parasitic diseases:—							
(1) Vaccinia including post vaccinal encephalitis ..		..	3	..	3	..	
(2) Other sequelæ of vaccination ..		..	2	..	2	..	
(3) Rubella ..		..	2	..	2	..	
(4) Varicella (chicken-pox) ..		4	427	..	431	16	
(5) Mumps and its complications ..		..	30	..	30	2	
(6) Dengue ..		..	18	..	18	..	
(7) Melioidosis ..		..	..	..	..	..
(8) Myiasis ..		..	..	..	..	..
(9) Glandular fever ..		..	..	..	..	..
(10) Others ..		..	..	..	..	..
Carried forward ..		660	7,109	697	7,769	694	

APPENDIX VII—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR, 1950—continued

Diseases	*Remaining at end of 1949	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1950	Remarks
		Admis- sions	Deaths			
<i>Brought forward</i> ..	660	7,109	697	7,769	694	
<i>II.—Cancer and other Tumours</i>						
45. Cancer or other malignant diseases of the buccal cavity, and pharynx and œsophagus	4	54	15	58	3	
46. Cancer or other malignant tumours of the digestive organs, and peritoneum:—						
(1) Stomach	3	87	40	90	1	
(2) Liver .. ..	..	49	25	49	2	
(3) Other digestive organs ..	2	43	14	45	..	
47. Cancer or other malignant tumours of the respiratory organs ..	2	46	21	48	2	
48. Cancer or other malignant tumours of the uterus .. ..	..	203	13	203	..	
49. Cancer or other malignant tumours of other female genital organs ..	..	9	2	9	..	
50. Cancer or other malignant tumours of the breast	2	28	5	30	1	
51. Cancer or other malignant tumours of the male genito-urinary organs ..	4	26	3	30	2	
52. Cancer or other malignant tumours of the skin .. ..	..	18	4	18	..	
53. Cancer or other malignant tumours of organs not specified	5	84	14	89	10	
54. Tumours non-malignant:—						
(1) Of female genital organs ..	..	111	1	111	..	
(2) Of other sites .. ..	..	88	2	88	..	
55. Tumours of undetermined nature:—						
(1) Female genital organs ..	..	4	..	4	..	
(2) Other sites	3	52	8	55	2	
<i>III.—Rheumatism, Diseases of Nutrition and of Endocrine Glands and other General Diseases.</i>						
56. Rheumatic Fever:—						
(1) With cardiac involvement ..	4	46	8	50	1	
(2) Without cardiac involvement	3	20	..	23	3	
57. Rheumatism and Arthritis (non-suppurative)	9	128	..	137	7	
58. Gout .. ..	..	3	..	3	..	
59. Diabetes (not including diabetes insipidus)	4	92	2	96	8	
60. Scurvy including (Barlow's disease)	..	..	..	..	..
61.—(1) Beri-beri including epidemic dropsy	1	28	9	29	1	
(2) Beri-beri associated with pregnancy or labour ..	..	..	..	..	..
<i>Carried forward</i> ..	706	8,328	883	9,034	737	

APPENDIX VII—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR, 1950—continued

Diseases	*Remaining at end of 1949	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1950	Remarks
		Admis- sions	Deaths			
<i>Brought forward</i> ..	706	8,328	883	9,034	737	
III.— <i>Rheumatism, Diseases of Nutrition and of Endocrine Glands and other General Diseases—(contd.)</i>						
62. Pellagra .. ..	..	..	..	..	..
63. Rickets	2	15	2	17	1	
64. Other diseases due to hypovitaminosis ..	..	10	1	10	..	
65. Diseases of the pituitary gland ..	1	1	..	2	..	
66. Diseases of the thyroid and parathyroid glands:—						
(1) Simple goitre .. ..	..	47	1	47	..	
(2) Exophthalmic goitre ..	7	83	8	90	2	
(3) Myxœdema, cretinism ..	..	..	..	..	..
(4) Tetany .. ..	..	11	..	11	1	
(5) Others .. ..	..	1	..	1	..	
67. Diseases of the thymus ..	..	1	..	1	..	
68. Diseases of the adrenal glands (excluding tuberculosis) ..	..	1	..	1	..	
69. Other diseases of metabolism, etc. ..	..	5	..	5	1	
IV.— <i>Diseases of the Blood and Blood Forming Organs</i>						
70. Hæmorrhagic conditions:—						
(1) Purpura	2	20	7	22	..	
(2) Hæmophilia .. ..	..	4	2	4	1	
71. Anæmia and chlorosis:—						
(1) Pernicious anæmia .. ..	..	..	..	..	..
(2) Splenic anæmia	1	6	1	7	..	
(3) Chlorosis .. ..	..	..	..	..	..
(4) Secondary anæmia	3	17	1	20	..	
(5) Tropical macrocytic anæmia ..	..	22	1	22	..	
(6) Others	8	138	17	146	11	
72. Leukæmia:—						
(1) Leukæmia .. ..	..	26	10	26	1	
(2) Hodgkin's diseases ..	2	13	3	15	..	
73. Diseases of the spleen not elsewhere mentioned .. ..	..	9	2	9	..	
74. Other diseases of the blood and blood forming organs .. ..	..	..	..	..	..
V.— <i>Chronic Poisoning</i>						
75. Alcoholism (acute or chronic) including inebriety .. ..	..	25	..	25	..	
<i>Carried forward</i> ..	732	8,783	939	9,515	755	

APPENDIX VII—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR, 1950—continued

Diseases	*Remaining at end of 1949	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1950	Remarks
		Admis- sions	Deaths			
<i>Brought forward</i> ..	732	8,783	939	9,515	755	
V.—Chronic Poisoning						
76. Poisoning by other organic substances (not by violence) .. ..	..	..	..	..	..
(1) Opium	1	40	2	41	..	
(2) Morphia, cocaine .. ..	..	1	..	1	..	
(3) Others .. ..	..	..	..	..	..
77. Poisoning by mineral substances (not by violence) .. ..	..	..	..	..	..
(1) Lead .. ..	..	8	..	8	..	
(2) Arsenic .. ..	..	3	2	3	..	
(3) Others .. ..	..	5	..	5	..	
VI.—Diseases of the Nervous System and Sense Organs						
78. Encephalitis (not including enceph- halitis lethargica):—						
(1) Cerebral abscess .. ..	..	7	6	7	1	
(2) Other forms of encephalitis	1	32	16	33	2	
79. Meningitis (not including tuberculous meningitis or cerebrospinal menin- gitis)	5	85	38	90	2	
80. Tabes dorsalis (Locomotor ataxia)	1	6	..	7	2	
81. Other diseases of the spinal cord	21	41	2	62	23	
82. Cerebral vascular accidents	7	131	35	138	6	
83. General paralysis of the insane	51	19	1	70	3	
84. Other forms of insanity, i.e. not 83, 150 (1), 162 (1), or 203	948	951	57	1,899	1,210	
85. Epilepsy	18	45	2	63	2	
86. Infantile convulsions (age under 5 years)	1	24	2	25	1	
87. Other diseases of the nervous system:—						
(1) Chorea .. ..	..	6	..	6	..	
(2) Neuritis and neuralgia	3	45	1	48	4	
(3) Paralysis agitans	24	11	2	35	24	
(4) Disseminated sclerosis .. ..	..	1	..	1	..	
(5) Neurasthenia	1	8	..	9	..	
(6) Hysteria	1	24	..	25	1	
(7) Others	1	81	4	82	4	
88. Diseases of the eye:—						
(1) Conjunctivitis	3	223	..	226	3	
(2) Trachoma	1	75	..	76	3	
(3) Corneal ulcer	4	23	..	27	2	
(4) Cataract	15	217	..	232	11	
(5) Others	49	615	2	664	43	
<i>Carried forward</i> ..	1,888	11,510	1,111	13,398	2,102	

APPENDIX VII—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR, 1950—continued

Diseases	*Remaining at end of 1949	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1950	Remarks
		Admis- sions	Deaths			
<i>Brought forward</i> ..	1,888	11,510	1,111	13,398	2,102	
VI.—Diseases of the Nervous System and Sense Organs—(contd.)						
89. Diseases of the ear and/or the mastoid sinus:—						
(1) Otitis externa .. ..	..	21	..	21	..	
(2) Otitis media and its compli- cations	4	91	4	95	1	
(3) Others .. ..	..	4	..	4	..	
VII.—Diseases of the Circulatory System						
90. Pericarditis .. ..	..	3	1	3	..	
91. Acute endocarditis:—						
(1) Malignant .. ..	..	16	11	16	..	
(2) Others (not included elsewhere)	..	10	7	10		
92. Chronic endocarditis: valvular disease (except due to specific cause else- where stated)	7	190	31	197	5	
93. Diseases of the myocardium (except due to specific cause elsewhere stated)	1	2	3	3	..	
94. Diseases of the coronary arteries (including Angina pectoris) ..	..	44	21	44	3	
95. Other diseases of the heart (unless due to specific cause elsewhere stated):—						
(1) Auricular fibrillation ..	5	16	2	21	3	
(2) Heart block .. ..	..	2	..	2	..	
(3) Others .. ..	..	29	7	29	6	
96. Aneurysm (unless due to specific cause elsewhere stated):—						
(1) Aneurysm of aorta ..	..	15	2	15	1	
(2) Aneurysm of other arteries	..	7	..	7	..	
97. Arterio-sclerosis (other than (82), etc.)	4	10	6	14	2	
98. Gangrene .. ..	..	11	..	11	3	
99. Other diseases of the arteries ..	1	8	1	9	..	
100. Diseases of the veins:—						
(1) Varicose veins	2	30	1	32	1	
(2) Hæmorrhoids	1	143	..	144	1	
(3) Phlebitis .. ..	..	8	..	8	..	
(4) Thrombosis .. ..	..	4	1	4	..	
(5) Others .. ..	..	3	..	3	..	
101. Diseases of the lymphatic system:—						
(1) Lymphangitis .. ..	..	10	..	10	..	
(2) Lymphadenitis	2	77	..	79	1	
(3) Bubo (non-specified) ..	..	18	..	18	..	
<i>Carried forward</i> ..	1,915	12,282	1,209	14,197	2,129	

APPENDIX VII—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR, 1950—continued

Diseases	*Remaining at end of 1949	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1950	Remarks
		Admis- sions	Deaths			
<i>Brought forward</i> ..	1,915	12,282	1,209	14,197	2,129	
VII.— <i>Diseases of the Circulatory System</i> —(contd.)						
102. Abnormalities of blood pressure:—						
(1) High blood pressure ..	26	237	58	263	10	
(2) Low blood pressure ..	..	..	..	..	..
103. Other diseases of the Circulatory system:—						
(1) Epistaxis ..	..	17	..	17	1	
(2) Others (including unexplained hæmorrhages) ..	..	6	..	6	..	
VIII.— <i>Diseases of the Respiratory System</i>						
104. Diseases of the nasal fossæ and its annexa:—						
(1) Diseases of the nose ..	..	127	..	127	..	
(2) Diseases of the accessory nasal sinuses..	..	105	..	105	..	
105. Diseases of the larynx:—						
(1) Laryngismus stridulus ..	..	3	..	3	..	
(2) Laryngitis (acute or chronic, of non-specific etiology) ..	..	16	..	16	..	
(3) Other diseases of the larynx ..	..	..	..	..	..
106. Bronchitis:—						
(1) Acute ..	2	102	5	104	3	
(2) Chronic ..	..	39	3	39	2	
(3) Not defined as acute or chronic	2	206	5	208	1	
107. Broncho-pneumonia ..	3	543	368	546	3	
108. Lobar-pneumonia ..	1	250	20	251	4	
109. Pneumonia (not otherwise defined)	3	77	7	80	6	
110. Pleurisy:—						
(1) Empyema ..	4	43	16	47	4	
(2) Other pleurisy ..	7	99	9	106	8	
111. Congestion and hæmorrhagic infarction of lung, etc:—						
(1) Hypostatic congestion of lung ..	..	1	1	1	..	
(2) Massive collapse ..	..	2	..	2	..	
(3) Pulmonary embolism ..	..	2	2	2	..	
(4) Others ..	..	12	..	12	1	
112. Asthma ..	6	152	4	158	10	
113. Pulmonary emphysema ..	3	14	4	17	5	
<i>Carried forward</i> ..	1,972	14,335	1,711	16,307	2,187	

APPENDIX VII—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR, 1950—continued

Diseases	*Remaining at end of 1949	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1950	Remarks
		Admis- sions	Deaths			
<i>Brought forward</i> ..	1,972	14,335	1,711	16,307	2,187	
VIII.— <i>Diseases of the Respiratory System—(contd.)</i>						
114. Other diseases of the respiratory system:—						
(1) Chronic interstitial pneumonia (including occupational diseases of the lung)	..	..	..	..	..
(2) Gangrene of the lung ..	..	5	3	5	..	
(3) Abscess of the lung ..	6	28	6	34	6	
(4) Bronchiectasis ..	7	80	10	87	6	
(5) Others ..	..	26	2	26	2	
IX.— <i>Diseases of the Digestive System</i>						
115. Diseases of the buccal cavity, pharynx, etc.:—						
(1) Pyorrhœa and Gingivitis ..	3	106	..	109	1	
(2) Dental caries ..	..	15	..	15	..	
(3) Stomatitis ..	..	24	2	24	..	
(4) Vincent's or Ludwig's Angina ..	..	12	..	12	..	
(5) Diseases of the tonsils ..	6	579	..	585	..	
(6) Others, including coryza, acute naso-pharyngitis, etc. ..	4	423	3	427	2	
116. Diseases of the œsophagus ..	1	42	5	43	..	
117. Ulcer of the stomach or duodenum:—	..	..	..	..	..
(1) Ulcer of the stomach ..	10	186	15	196	15	
(2) Ulcer of the duodenum ..	1	80	4	81	5	
118. Other diseases of the stomach:—						
(1) Gastritis ..	5	131	1	136	2	
(2) Others, e.g. indigestion ..	6	102	11	108	5	
119. Diarrhœa and enteritis (under 2 years)	12	691	332	703	11	
120. Diarrhœa and enteritis:—						
(2 years and over)						
(1) Colitis ..	..	55	1	55	..	
(2) Otherwise defined, including gastro-enteritis ..	1	219	20	220	8	
121. Appendicitis ..	11	583	15	594	9	
122. Hernia, Intestinal obstruction:—						
(1) Hernia ..	6	249	6	255	4	
(2) Strangulated hernia ..	..	60	10	60	1	
(3) Intestinal obstruction (including intussusception) ..	2	48	20	50	3	
123. Other diseases of the intestines:—						
(1) Constipation, intestinal stasis ..	..	28	1	28	..	
(2) Diseases of Rectum or Anus ..	..	68	1	68	1	
(3) Others, e.g., intestinal colic ..	8	171	1	179	1	
<i>Carried forward</i> ..	2,061	18,346	2,180	20,407	2,269	

APPENDIX VII—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR, 1950—continued

Diseases	*Remaining at end of 1949	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1950	Remarks
		Admis- sions	Deaths			
<i>Brought forward</i> ..	2,061	18,346	2,180	20,407	2,269	
<i>IX.—Diseases of the Digestive System—(contd.)</i>						
124. Cirrhosis of liver:— (non-syphilitic)						
(1) Alcoholic .. ..	..	43	18	43	..	
(2) Not returned as alcoholic ..	4	31	7	35	1	
125. Other diseases of the liver:—						
(1) Acute yellow atrophy .. ..	..	4	2	4	..	
(2) Toxic hepatitis	1	102	10	103	6	
(3) Amœbic abscess and hepatitis ..	2	37	4	39	..	
(4) Others .. ..	..	3	2	3	..	
126. Biliary calculi or Biliary colic ..	1	38	8	39	1	
127. Other diseases of the gall bladder and ducts:—						
(1) Cholecystitis without record of calculi	6	76	9	82	3	
(2) Others, e.g., catarrhal jaundice ..	..	13	1	13	..	
128. Diseases of the pancreas (excluding diabetes mellitus) .. ..	..	5	3	5	..	
129. Peritonitis, without stated cause:—	..	..	..	..	..
(1) Acute	1	42	28	43	..	
(2) Chronic .. ..	..	20	4	20	1	
<i>X.—Diseases of the Genito-Urinary System (non-venereal)</i>						
130. Acute nephritis	7	98	4	105	8	
131. Chronic nephritis	8	111	15	119	2	
132. Nephritis (undefined as acute or chronic)	2	55	22	57	1	
133. Other diseases of the kidney and annexa:—						
(1) Pyelitis	3	146	5	149	2	
(2) Others	5	45	4	50	3	
134. Calculi of the urinary passages:—						
(1) Calculi of the kidney and ureter, or renal colic	2	107	1	109	1	
(2) Calculi of the bladder or urethra ..	..	39	..	39	..	
(3) Calculi of unstated site .. ..	..	1	..	1	..	
135. Diseases of the Bladder:—	..					
(1) Cystitis .. ..	..	24	..	24	1	
(2) Others .. ..	..	8	2	8	..	
136. Diseases of the urethra:—	..					
(1) Stricture .. ..	..	31	..	31	..	
(2) Others .. ..	..	27	..	27	1	
137. Diseases of the prostate	3	37	1	40	5	
<i>Carried forward</i> ..	2,106	19,489	2,330	21,595	2,305	

APPENDIX VII—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR, 1950—continued

Diseases	*Remaining at end of 1949	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1950	Remarks
		Admis- sions	Deaths			
<i>Brought forward</i> ..	2,106	19,489	2,330	21,595	2,305	
<i>X.—Diseases of the Genito-Urinary System (non-venereal)—(contd.)</i>						
138. Diseases of the male genital organs:—						
(1) Epididymitis .. ..	..	8	..	8	..	
(2) Orchitis .. ..	..	18	..	18	1	
(3) Hydrocele .. ..	..	124	..	124	..	
(4) Others, e.g., phimosis ..	2	85	..	87	1	
139. Diseases of the female genital organs:—						
(1) Diseases of the ovary ..	..	110	2	110	1	
(2) Diseases of the fallopian tube	2	171	..	173	1	
(3) Diseases of the parametrium	..	22	..	22	..	
(4) Diseases of the uterus, including menorrhagia and dysmenorrhœa ..	4	475	..	479	3	
(5) Diseases of the breast ..	1	46	..	47	1	
(6) Other diseases of the female genital organs, e.g. prolapse	2	181	1	183	3	
<i>XI.—Conditions arising in Pregnancy, Childbirth and the Puerperal State</i>						
140. Post abortive sepsis .. ..	..	122	..	122	1	
141. Abortion not returned as septic ..	4	649	..	653	4	
142. Ectopic gestation	1	68	4	69	..	
143. Other accidents of pregnancy ..	2	145	1	147	2	
144. Hæmorrhage connected with childbirth:—						
(1) Placenta prævia	1	99	1	100	..	
(2) Others .. ..	..	166	9	166	2	
145. Puerperal sepsis:—						
(1) Puerperal septicæmia .. ..	..	14	3	14	..	
(2) Puerperal sepsis, not including septicæmia	5	527	..	532	3	
146. Albuminuria and convulsions connected with pregnant state:—						
(1) Ante-partum eclampsia	1	47	12	48	..	
(2) Intra-partum eclampsia						
(3) Post-partum eclampsia						
(4) Albuminuria of pregnancy	4	272	2	276	3	
(5) Pyelitis of pregnancy .. ..	..	37	..	37	..	
(6) Otherwise defined .. ..	..	264	3	264	2	
147. Other Toxæmias of pregnancy:—						
(1) Hyperemesis gravidarum ..	..	37	..	37	..	
(2) Others .. ..	..	4	1	4	..	
148. Puerperal phlegmasia or embolism:—						
(1) Puerperal phlegmasia .. ..	..	..	..	..	..
(2) Puerperal embolism .. ..	..	..	..	..	..
149. Conditions associated with Labour:—						
(1) Normal labour	159	12,215	..	12,374	156	
<i>Carried forward</i> ..	2,294	35,395	2,369	37,689	2,489	

APPENDIX VII—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR, 1950—continued

Diseases	*Remaining at end of 1949	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1950	Remarks
		Admis- sions	Deaths			
<i>Brought forward</i> ..	2,294	35,395	2,369	37,689	2,489	
<i>XI.—Conditions arising in Pregnancy, Childbirth and the Puerperal State—(contd.)</i>						
(2) Abnormal labour, e.g., needing instrumental interference ..	..	275	2	275	2	
(3) Labour complicated with inter- current disease ..	..	34	4	34	..	
(4) Accidents of childbirth ..	4	373	15	377	4	
150. Other or unspecified conditions of the puerperal state:—						
(1) Puerperal insanity ..	1	1	..	2	..	
(2) Puerperal disease of the breast ..	1	39	..	40	..	
(3) Others ..	..	..	..	..	..
<i>XII.—Diseases of the Skin and Cellular Tissues</i>						
151. Carbuncle, boil ..	1	98	..	99	1	
152. Cellulitis, or abscess (except due to cause given elsewhere) ..	17	706	19	723	20	
153. Other diseases of the skin, hair, and nails:—						
(1) Ulcers ..	2	115	2	117	2	
(2) Dermal mycoses ..	..	19	..	19	..	
(3) Herpes, including Zoster ..	1	21	..	22	1	
(4) Scabies ..	7	37	..	44	2	
(5) Others ..	11	439	3	450	14	
<i>XIII.—Diseases of the Bones and Organs of Locomotion</i>						
154. Acute or Chronic infective osteo- myelitis and periostitis, except due to cause given elsewhere ..	3	118	2	121	6	
155. Other diseases of the bones ..	1	10	..	11	2	
156. Diseases of the joints and other organs of locomotion:—						
(1) Diseases of the joints (other than stated elsewhere) ..	3	37	..	40	2	
(2) Diseases of the other organs of locomotion ..	..	32	1	32	2	
<i>XIV.—Congenital Malformations</i>						
157. Congenital malformations:—						
(1) Congenital hydrocephalus ..	1	7	4	8	..	
(2) Spina bifida and meningocele ..	..	4	4	4	..	
(3) Congenital malformation of the heart ..	..	39	19	39	1	
<i>Carried forward</i> ..	2,347	37,799	2,444	40,146	2,548	

APPENDIX VII—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR, 1950—continued

Diseases	*Remaining at end of 1949	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1950	Remarks
		Admis- sions	Deaths			
<i>Brought forward</i> ..	2,347	37,799	2,444	40,146	2,548	
XIV.—Congenital Malformations —(contd.)						
(4) Monstrosities .. ..	..	..	..	..	..
(5) Congenital hypertrophic pyloric stenosis .. ..	..	2	..	2	..	
(6) Cleft palate, harelip ..	1	60	..	61	..	
(7) Imperforate anus .. ..	..	12	5	12	2	
(8) Other congenital malformations	1	39	10	40	2	
XV.—Diseases of early Infancy						
158. Congenital debility, including maras- mus of unknown cause .. ..	..	39	22	39	..	
159. Premature birth	2	46	28	48	..	
160. Injury at birth .. ..	..	1	1	1	..	
161. Other diseases peculiar to early infancy:—						
(1) Atelectasis pulmonum ..	..	3	2	3	..	
(2) Icterus neonatorum .. ..	..	..	..	..	..
(a) Mild .. ..	..	..	..	..	..
(b) Grave .. ..	..	10	10	10	..	
(3) Affections of the umbilicus ..	..	3	2	3	1	
(4) Pemphigus neonatorum ..	..	..	..	..	..
(5) Others .. ..	..	3	2	3	..	
XVI.—Conditions Associated with Old Age						
162.—(1) Senile dementia	1	1	..	2	..	
(2) Other forms of senile decay ..	1	19	1	20	2	
XVII.—Affections Produced by External Causes						
163. Suicide, or attempted suicide, by poisoning (including corrosive poisoning) ..	1	165	62	166	5	
164. Suicide, or attempted suicide, by gas poisoning .. ..	..	..	..	..	..
165. Suicide, or attempted suicide, by hanging or strangulation .. ..	..	3	..	3	..	
166. Suicide, or attempted suicide, by drowning .. ..	..	11	..	11	..	
167. Suicide, or attempted suicide, by firearms .. ..	..	..	..	..	..
168. Suicide, or attempted suicide, by cutting or piercing instruments ..	..	9	4	9	1	
<i>Carried forward</i> ..	2,354	38,225	2,593	40,579	2,561	

APPENDIX VII—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR, 1950—continued

Diseases	*Remaining at end of 1949	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1950	Remarks
		Admis- sions	Deaths			
<i>Brought forward</i> ..	2,354	38,225	2,593	40,579	2,561	
<i>XVII.—Affections Produced by External Causes—(contd.)</i>						
169. Suicide, or attempted suicide, by jumping from a height ..	..	2	..	2	..	
170. Suicide, or attempted suicide, by crushing .. ..	..	..	..	..	..
171. Suicide, or attempted suicide, by other means .. ..	..	6	..	6	2	
172. Infanticide .. ..	..	..	..	..	..
173. Assault or homicide, by firearms ..	..	46	13	46	8	
174. Assault or homicide, by cutting or piercing instruments .. ..	..	66	6	66	1	
175. Assault or homicide, by other means	3	223	4	226	1	
176. Attacks by venomous animals:—						
(1) Snake bite .. ..	..	4	..	4	..	
(2) Insect bite .. ..	..	7	..	7	..	
(3) Others	1	11	1	12	..	
177. Food poisoning .. ..	..	8	..	8	..	
178. Accidental absorption of irrespirable or poisonous gas .. ..	..	2	..	2	..	
179. Other acute accidental poisoning ..	1	51	1	52	1	
180. Injuries due to conflagration ..	..	..	..	..	..
181. Accidental burns:—						
(Conflagration excepted)						
(1) Burns by fire	1	132	22	133	5	
(2) Scalds	3	144	1	147	2	
(3) Burns by corrosive sub- stances, external or internal	1	15	..	16	4	
(4) Dermatitis due to exposure to sun .. ..	..	..	..	..	..
(5) Dermatitis due to exposure to other forms of radiation	..	5	..	5	2	
182. Accidental mechanical suffocation ..	..	..	..	..	..
183. Accidental immersion or drowning ..	..	5	1	5	..	
184. Accidental injury by firearms ..	..	2	..	2	..	
185. Accidental injury by cutting or pier- cing instruments .. ..	..	78	1	78	..	
186. Accidental injury by fall, crushing. etc:—						
(1) By fall	37	999	64	1,036	29	
(2) By Machinery	1	69	..	70	..	
(3) By motor vehicles	20	612	52	632	26	
(4) By railway vehicles .. ..	..	4	..	4	..	
(5) By other means	42	700	25	742	47	
187. Cataclysm:—						
(tidal waves, cyclones, etc). ..	..	..	..	..	..
188. Injury by animals (except bites or stings of venomous reptiles or insects)	1	35	..	36	1	
<i>Carried forward</i> ..	2,465	41,451	2,784	43,916	2,690	

APPENDIX VII—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR, 1950—continued

Diseases	†Remaining at end of 1949	YEARLY TOTAL		†Total cases treated	†Remaining at end of 1950	Remarks
		Admis- sions	Deaths			
<i>Brought forward</i> ..	2,465	41,451	2,784	43,916	2,690	
XVII.—Affections Produced by External Causes—(contd.)						
189. Hunger or thirst .. ..	..	..	..	..	..
190. Excessive cold .. ..	..	..	..	..	..
191. Excessive heat .. ..	..	..	..	..	..
192. Lightning .. ..	..	..	..	..	..
193. Electricity	1	3	1	4	..	
194. Other unstated forms of violence:—						
(1) Inattention at birth ..	..	..	..	..	..
(2) Others, e.g. foreign body swallowed	1	64	..	65	1	
195. Violence of an unstated nature (<i>i.e.</i> suicidal, homicidal, or accidental, by poisoning or any other means)	..	18	3	18	..	
196. Wounds or other injuries of War ..	..	..	..	..	..
197. Execution of civilians by belligerent armies .. ..	..	..	..	..	..
198. Execution .. ..	..	..	..	..	..
XVIII.—Ill-defined Conditions						
199. Sudden illness (cause unknown) ..	1	4	..	5	..	
200. Cause of illness unstated or ill-defined	52	969	35	1,021	50	
201. Diseases not included in this classifi- cation elsewhere which have caused no deaths .. ..	..	17	..	17	..	
202. Malingering .. ..	..	..	..	..	..
203. Cases admitted to hospital for observa- tion as to mental condition ..	7	88	..	95	4	
204. Cases admitted for observation (not mental) .. ..	..	178	..	178	5	
205. Persons accompanying patients ..	..	46	..	46	..	
Total ..	2,527	42,838	2,823	45,365	2,750	

APPENDIX VII—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR, 1950—continued

Nationalities				*Remaining in hospital at end of 1949	YEARLY TOTAL		Total † cases treated	† Remaining in hospital at end of 1950	Remarks
					Admissions	Deaths			
Europeans	..	..	..	39	1,180	26	1,219	30	
Eurasians	..	..	..	50	853	37	903	59	
Chinese	..	..	..	2,016	31,577	2,454	33,593	2,280	
Indians	..	..	..	240	5,795	177	6,035	183	
Malays	..	..	..	141	2,784	104	2,925	158	
Javanese	..	..	..	9	181	16	190	7	
Others	..	..	..	32	468	9	500	33	
TOTAL				2,527	42,838	2,823	45,365	2,750	
Persons accompanying patients				..	46	..	46	..	

APPENDIX VIII

TYPES OF MALARIA SEEN IN THE GENERAL HOSPITAL DURING THE YEAR 1950

Type					Admissions	Deaths
Sub-Tertian	...	...	...	...	103	16
Tertian	...	...	...	...	24	—
Quartan	...	...	...	...	2	—
Mixed	...	...	...	...	1	—
Black Water Fever	...	...	...	...	2	—
Cachexia	...	...	...	...	1	1
Total					133	17

TERMINAL CAUSES OF DEATH IN MALARIA

Cause					Number
Cardiac Failure	...	...	...	...	2
Cerebral malaria	...	...	...	...	13
Malaria with pneumonia	...	...	...	...	2
Total					17

APPENDIX IX

TABLE SHOWING MAIN CAUSES OF MORBIDITY OF IN-PATIENTS IN THE
GENERAL HOSPITAL FOR THE YEAR 1950 AND 1949

Causes of Death	1950		1949	
	ADMISSIONS	DEATHS	ADMISSIONS	DEATHS
Enteric Group	100	16	69	10
Typhus	23	..	33	2
Malaria	214	17	252	24
Diphtheria	14	3	20	5
Influenza	67	1	31	4
Dysentery, Diarrhoea and Enteritis ..	898	360	784	264
Leprosy	12	..	5	..
Tuberculosis Respiratory System ..	557	101	421	72
Other Tuberculous Diseases ..	396	197	425	193
Cancer	574	137	550	104
Beri Beri	26	8	26	10
Cerebral Haemorrhage	130	35	168	67
Diabetes	88	2	89	11
Bronchitis	202	13	236	8
Pneumonia all forms	800	382	677	314
Other Respiratory Diseases ..	598	44	278	33
Ulcer of Stomach Duodenum, etc. ..	246	19	169	30
Ankylostomiasis	55	1	57	..
Other Intestinal Parasites ..	88	5	70	2
Appendicitis	574	15	469	9
Cirrhosis of Liver	71	21	67	19
Acute and Chronic Nephritis ..	181	14	153	30
Venereal Affections	134	18	135	14
Congenital Debility and Malnutrition, Premature Birth, etc.	108	53	53	17
Suicidal	195	65	113	52
Other forms of Violence	3,166	194	2,487	136
Other Diseases	8,506	651	7,641	575
Total ..	17,886	2,372	15,478	2,005

APPENDIX X

RETURN OF SPECIMENS EXAMINED IN THE CLINICAL LABORATORY FROM
JANUARY TO 31st DECEMBER, 1950*Examination of Blood—Physiological*

Leucocyte Count	...	...	...	...	12,299
Differential Leucocyte Count	...	...	...	...	12,223
Erythrocyte Count	...	...	...	...	9,510
Estimation of Hæmoglobin	...	...	...	...	9,876
Blood Picture	...	...	...	...	245
Lymphoid Leukæmia	...	...	...	...	14
Myeloid Leukæmia	...	...	...	...	28
Parasite Count	...	...	...	...	22
Estimation of Size of R.B.C.	...	...	...	...	200
Reticulocyte Count	...	...	...	...	763
Thrombocyte Count	...	...	...	...	633
Bleeding Time	...	...	...	...	399
Coagulation Time	...	...	...	...	396
Prothrombin Time	...	...	...	...	182
Colour Index	...	...	...	...	42
Blood Sedimentation Rate	...	...	...	...	5,276
Fragility of R.B.C.	...	...	...	...	12
Packed Cell Volume	...	...	...	...	606
Mean Corpuscular Volume	...	...	...	...	4
Mean Corpuscular Hæmoglobin Content	...	...	...	...	4
Clot Retraction	...	...	...	...	1
Formalgel Test Neg.	...	...	...	...	3
					52,738

Examination of Blood—Biochemical

Blood Urea	...	...	...	...	1,577
Blood Sugar	...	...	...	...	338
Blood Cholesterol	...	...	...	...	78
Blood Uric Acid	...	...	...	...	55
Blood Calcium	...	...	...	...	138
Blood Phosphate	...	...	...	...	62
Blood Icteric Index	...	...	...	...	628
Blood Van den Bergh Reaction	...	...	...	...	628
Blood Protein	...	...	...	...	568
Blood Takata-ara Test Negative	141	...	...	...
Positive	131	...	...	...	272
Blood Glucose Tolerance Test—233 cases	...	...	...	...	1,093
Blood Bromine	...	...	...	...	3
Blood Creatine	...	...	...	...	2
Blood Chlorides	...	...	...	...	6
					5,448

Examination of Urine—Biochemical

Urea Clearance Test	...	...	...	...	165
Urea Concentration Test—53 cases	...	...	...	...	212
Sugar Estimation	...	...	...	...	21
Diastase	...	...	...	...	26
Chlorides	...	...	...	...	446

Carried forward ... 870

Carried forward ... 58,186

APPENDIX X—continued

RETURN OF SPECIMENS EXAMINED IN THE CLINICAL LABORATORY FROM
JANUARY TO 31st DECEMBER, 1950—continued

<i>Brought forward ...</i>					95,801
<i>Examination of Blood Films</i>					
Subtertian Malaria ...	...	...	...	...	199
Benign Tertian Malaria ...	...	...	...	...	67
Quartan ...	...	...	...	...	2
Crescents ...	...	...	...	...	143
Mixed infection					
No Malarial Parasites ...	...	...	...	...	12,608
Micro-Filaria Positive ...	...	...	...	...	29
Micro-Filaria Negative ...	...	...	...	...	290
Punctuate Basophilia Negative	...	...	...	53	
Positive	...	...	...	7	
				60	
					13,398
<i>Examination of Smears</i>					
Prostatic Smear—No. G.C.	...	...	...	130	
Prostatic Smear—G.C.†	...	...	...	1	
Urethral Smear—No. G.C.	...	...	...	47	
Urethral Smear—G.C.†	...	...	...	27	
Vaginal Smear—No. G.C.	...	...	...	92	
Vaginal Smear—G.C.†	...	...	...	3	
Cervical Smear—No. G.C.	...	...	...	44	
Eye Smear—G.C.† ...	...	...	...	6	
Eye Smear—Other Org.	...	...	...	144	
Throat Swab—K.L.B.	...	...	...	24	
Throat Swab—Negative	...	...	...	344	
Throat Swab—Other org.	...	...	...	356	
Throat Swab—T.B. ...	...	...	...	2	
Nasal Swab—K.L.B.	...	...	...	2	
Nasal Swab—Negative	...	...	...	74	
Nasal Swab—Other org.	...	...	...	76	
Ear Clip, etc.—Negative	...	...	...	152	
—L.B.	...	...	...	81	
				1,605	
					1,605
<i>Examination of Skin Scrapings</i>					
Fungi—Positive ...	...	...	...	35	
Fungi—Negative ...	...	...	...	96	
Scabies Parasites—Positive	...	...	...	29	
Scabies Parasites—Negative	...	...	...	77	
L.D. Bodies—Negative	...	...	...	1	
				238	
					238
<i>Examination of Sputa</i>					
Tubercle Bacilli ...	...	...	...	414	
Negative ...	...	...	...	9,004	
Other organisms ...	...	...	...	199	
				9,617	
					9,617
<i>Examination of Stool</i>					
Entamœba Histolytica ...	...	...	...	50	
Entamœba Coli ...	...	...	...	5	
Entamœba Histolytica Cyst	...	...	...	3	
Entamœba Coli Cyst	...	...	...	7	
Giardia Lamblia ...	...	...	...	1	
Giardia Lamblia Cyst	...	...	...	17	
Trichomonas Hominis	...	...	...	30	
Occult Blood Positive	...	...	...	1,103	
Occult Blood Negative	...	...	...	2,223	
Tubercle Bacilli—Negative	...	...	...	37	
—Positive	...	...	...	1	
				3,477	
					3,477
<i>Carried forward ...</i>					124,136

APPENDIX X—*continued*RETURN OF SPECIMENS EXAMINED IN THE CLINICAL LABORATORY FROM
JANUARY TO 31st DECEMBER, 1950—*continued*

				<i>Brought forward</i> ...	124,136
Ankylostoma ova	...	...	...	...	1,547
Ascaris Lumb. ova	...	...	...	...	1,596
Trichuris Trichura ova	...	...	...	...	357
Oxyuris Verm. ova	...	...	...	...	13
Strongyloides ova and Larvæ	...	...	...	...	18
Clonorchis Sinensis ova	...	...	...	...	12
Hymenolepsis Nana and Anky. ova	...	...	...	...	1
Anky. and Ascaris ova	...	...	...	...	395
Anky. and Oxyuris Verm. ova	...	...	...	...	4
Ascaris and Oxyuris Verm. ova	...	...	...	...	5
Anky., Ascaris and Oxyuris Verm. ova	...	...	...	...	2
Anky. and Trichuris Trichura ova	...	...	...	...	148
Ascaris and Trichuris Trichura ova	...	...	...	...	213
Anky., Ascaris and T. Trichura ova	...	...	...	...	98
Ascaris, T. Trichura and O. Verm. ova	...	...	...	...	1
					<hr/>
No ova seen	...	...	...	...	13,233
No amœba seen	...	...	...	...	7,956
					<hr/>
					21,189
					<hr/>
				Total	149,735
					<hr/>
Electrocardiogram	...	...	...	...	365 cases.
Basal Metabolic Rate	...	...	...	...	298 cases.

APPENDIX XI

OUT-PATIENTS

TOTAL ATTENDANCES AT THE OUT-PATIENT CLINICS DURING THE YEAR 1950
WERE DISTRIBUTED AS FOLLOWS:—

Hospital	New Cases	Repetitions	Total Attendances
General Hospital	53,811	108,713	162,524
Kandang Kerbau	50,619	56,213	106,832
Tan Tock Seng, Non-Tuberculosis ..	5,222	9,531	14,753
Tan Tock Seng, Tuberculosis	2,478	41,241	43,719
Bukit Timah O. D. D.	12,173	13,990	26,163
Paya Lebar O. D. D.	7,509	7,653	15,162
Social Hygiene	15,249	90,343	105,592
Police Families	2,642	16,581	19,223
			<hr/>
Total ..	149,703	344,265	493,968
			<hr/>
Total, 1949 ..	117,621	317,514	435,135
(Excluding Police trainees)			

